review

Electronic Technology

If awareness is the first step to creative change, then the awareness and implementation of the opportunities provided to the Cooperative Extension Services by the electronic age can augment our ability to achieve our goals: teaching, educating, and helping people help themselves.

The Extension Service Administrator's Office has identified eight significant areas of concentration as national initiatives. One of the eight is electronic technology, an area of vital interest and vast potential for Extension programs nationwide. In this issue of *Extension Review,* we explore current uses of electronic technology by Cooperative Extension across the country and plans for further exploration and use.

Electronic technology includes all types of electronic communications equipment (hardware) and applications (software). Regardless of the sophistication or simplicity of the hardware and the software, the end result is the rapid communication of information from person to person.

Congressional Interest
Interest in and use of electronic technology within agriculture continues to grow. In May 1982, Rep. George Brown (D-Calif) chaired combined hearings and workshops on "Applications of Computer Based Information Systems and Services in Agriculture." As chair of the Subcommittee on Department Operations, Research and Foreign Agriculture of the U.S. House of Representatives Committee on Agriculture, Brown told participants that he expected them to provide "insight and guidance to assist us in our future decisions on these technologies." Many of the Cooperative Extension Service systems and programs described in this issue were discussed at these hearings.

Microprocessing, teleconferencing, teletext, videotex, and cable TV are significantly influencing Cooperative Extension and its clientele. Extension Service-USDA and many states use audio- and video-teleconferencing to communicate with and train field staff members and volunteers. Extension field staff members use cable TV to target information to a wide home audience beyond our previous clientele.

Producers and users have acquired stand-alone processors or computer terminals (with or without printers) which hook to mainframe computers via the standard telephone line. In the Green Thumb system prototype, users "download" data through a telephone link into a "black box." The phone is disconnected and the data appear on the accessor's TV screen.

NARS Developed
Extension Service—USDA, in response to congressional requests, has worked with selected states in developing the conceptual design for an interactive computer-based data system. The objective is to enable quick response to external requests for information on the impact and cost effectiveness of Extension programs. Known as NARS, the Narrative Accomplishment Reporting System has been operating since 1979.

NARS provides electronic access to successful state Extension programs nationwide, improving accountability, methodology, and transfer of information. The NARS data base is available online through a national telecommunications network.

Many states have provided and retrieved data from NARS without technical training. This year, ES-USDA has asked states to use the NARS format to report on their accomplishments, cutting down on their burden of response while increasing the use of the most recent information on accomplishments. The national evaluation and accountability reporting system being developed will be based on this NARS concept.

Other Efforts
The Information Resource Management Office (IRMO) has been established at USDA and is headed by Ray Lett, Executive Assistant to Secretary John Block. Staff members are gathering data on electronic data dissemination by the Department and on software documentation and maintenance standards.

The Extension Committee on Organization and Policy has formed a Computer Task Force with representatives from each of the four Extension regions, research, instruction, and ES-USDA. Each of the regions is either studying or setting up regional computer centers or institutes.

ES-USDA, in keeping with its identification of national issues, has established an Electronic Technology Task Force with representatives from each ES-USDA program unit. The Task Force is developing a long-term plan of work, and in the short term it is providing expertise for the conducting of microcomputer clinics via teleconferencing and for electronic marketing training sessions.

There is an unstated emphasis on the common good for Cooperative Extension which can be realized by the cooperation of these groups and coordination of the many efforts. Cooperative Extension, the vital link in this chain, provides the balances between human contact and electronic delivery.—**Denzil Clegg, Associate Administrator**

(Editor's Note: With this issue, the *Extension Review* crosses the threshold into the electronic age. Using our new mailbox number—AGS—096—states transmit articles to us via electronic mail where they are stored in our microcomputer for editing and finalizing. Staffers use NARS and electronic mail to write national roundup articles, such as "High Tech for Food and Technology" featured in this issue. Requests for articles and photographs are transmitted via our Information and Communications staff's new electronic newsletter to Extension communications staffs throughout the land-grant system.)

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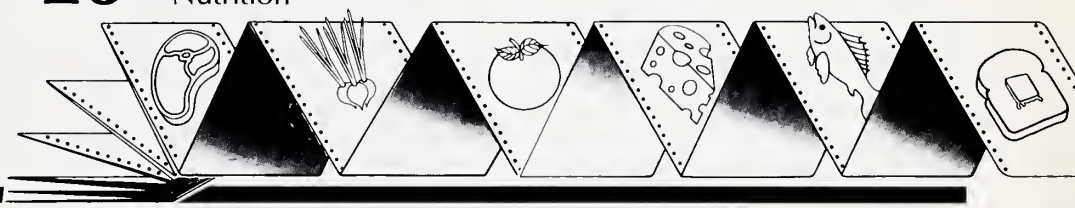

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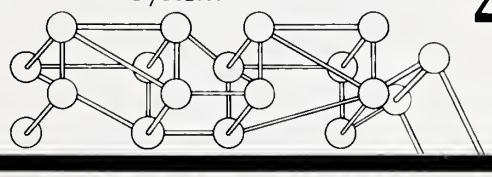

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John R. Block
Secretary of Agriculture

Mary Nell Greenwood
Administrator
Extension Service

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Director of Information: Ovid Bay
Editor: Patricia Loudon
Associate Editor: Judith Armstrong Bowers
Assistant Editor: James Wolfe
Editorial Assistant: Charlotte Long
Design Director: Deborah Shelton

Electronic Livestock Auction

Terry W. Canup, Director
Extension Information Offices
Virginia Polytechnic Institute and State University

It is fast, low-cost, and brings good prices for producers. It is the only livestock auction in America that is conducted by computer. You don't need a terminal degree to see that it is the wave of the future.

Each week, meatpackers from Ontario to Texas can bid confidentially against each other for slaughter lambs without leaving their offices. A packer can spend as little as 5 minutes to buy a load lot of lambs and get, in hand, a complete description of the purchase, including pickup points and total cost.

The group of Extension specialists from Virginia Tech (Virginia Polytechnic Institute and State University) who devised the computer-aided system call it revolutionary. The key to the system's singular success, however, may be that it was evolutionary in its development.

The Electronic Marketing Association, Inc. (EMA), which offers the computerized system to lamb marketing agents from its headquarters a few miles away from Virginia Tech, is the only commercial venture of its kind in livestock marketing.

Beginnings

Its roots go back to 1978 when the Agricultural Marketing Service of USDA sponsored five projects to investigate the potential of electronic marketing of livestock. One grant went to the Virginia Cooperative Extension Service in cooperation with the Virginia Department of Agriculture and Consumer Services. What that project group from Virginia capitalized on was a foundation of 20 years of telephone auctioning of livestock in Virginia.

"Introducing the computer to marketing in Virginia, where livestock were already being sold regularly by telephone, wasn't too big of a step to take," said James B. Bell, Extension project leader and agricultural economist.

The phone is used sometimes to include additional buyers in assembled sales and increase competition for livestock. Very often, however, buyers opt to take part in conference call teleauctions which sell livestock by description.

Teleauctions gave producers the option of knowing what prices their livestock fetched before they left the farm and buyers were spared the weight loss and stress to the animals that accompanies sale assembly.

In 1981, 2,000 head of cattle were sold by such teleauctions in Virginia. The teleauctions, however, have their shortcomings. Conference calls can be time consuming and confusing.

"It may take 15 minutes from the time the operator calls the first buyer to the time she calls the last buyer, by which time the first buyer has hung up," says Roy Meek, manager of the Eastern Lamb Producers Cooperative in Dublin, Va. "The packers don't have that kind of time."

Teleauctions can also be trying on the memories and note-taking abilities of buyers who must rely on oral descriptions of lot loads.

"After a teleauction sale I have had a packer say he wants delivery on a day on which I have already said the livestock weren't available. But he forgot," says Meek.

Computer Sales

Computer auctions address both problems nicely. A buyer with a terminal can receive a detailed printed sale order through his terminal hours before the sale. Computer sales are fast. Three loads of slaughter lambs totaling 1,200 head can be auctioned by computer to a group of 10 buyers in about 15 minutes. Some buyers even take portable terminals with them to assembled sales so they can take part in two auctions at once.

Despite the obvious advantages, the Virginia Tech team of James Bell, Wayne Purcell, also an agricultural economist, and K. C. Williamson, animal scientist, believe that participants could be scared off by a computer if its introduction made the marketing process too unfamiliar. They decided to make the computer behave as closely as possible to an auctioneer.

While buyers watch their terminals, the computer program prints out the opening price. If a predesignated period of time elapses without a bid, the price drops a dollar and will continue to do so until a buyer hits the bid key.

A bid registers on all the buyers' terminals and repeats every 5 seconds along with a countdown of the number of seconds left for the other buyers to register their own bids—68.00:25 . . . 68.00:20 . . . 68.00:15—almost as if to say "$68

Left: Employees of the Electronic Marketing Association Inc. use a computerized system for a weekly lamb sale for marketing agents. The system was devised by Extension specialists from Virginia Tech (VPSU).

Below: A livestock auctioneer takes a bid at a barn sale. A newly developed computerized auction system may revolutionize the way livestock auctions are conducted.

going once, $68 going twice," Upon hitting the bid key, a competing buyer automatically raises the bid by 25 cents.

The speed of the sale belies the amount of work that goes into making this convenience available. Cattle may not be shipped and herded before buyers, but a thorough description of the livestock has been collected and loads assembled, accounting for grade and location.

Marketing Process

Slaughter lamb assemblages in Virginia begin when producers call Extension agents, state marketing agents, or representatives of the Eastern Lamb Producers Cooperative to consign their lambs. The representative or agent forwards the descriptive details to the cooperative which assembles lots. By the morning of the sale, a description of the lambs for sale and a list of their pickup points are available for buyers to punch up on their computer terminals.

Sellers feel sure that the ease of the transactions translates into higher prices.

"It is a hard thing to measure, but I think we have seen a little strengthening of the prices because of the convenience to the buyers," says Meek. "For example, in our last sale, our lambs brought $74 when slaughter lambs were bringing only $68 on other markets."

James Russell, former research associate in agricultural economics at Virginia Tech, conducted formal studies on the effect of computer auctioning. There is solid evidence to support the idea that increased buyer access which accompanies the computer system helped increase prices to producers. The computer system also seems to pull up prices in nonelectronic markets.

The convenience for buyers and the price incentive for producers promise to pressure more livestock marketers into the computer arena.

Expansion

The Electronic Marketing Association has expanded its system to the Corn Belt lamb auction in Wisconsin. The system now serves producers in 13 states and a total of nine U.S. and two Canadian buyers.

The system's developers plan to expand into all arenas of livestock marketing.

The Virginia Tech Extension project team has already added computer programs for auctioning of feeder cattle, feeder pigs, and slaughter cattle.

As Virginia operates the largest officially graded feeder cattle sales program in the United States, that market seems a natural avenue for expansion of the computer auction concept.

There are roadblocks, however, as Meek explains. "With feeder cattle we have a lot more buyers and they are not regular buyers. They may buy a lot, and then not buy again for another year. They can't afford to buy a terminal to use once."

Meek does use a computerized listing and billing service in conjunction with teleauctioning of cattle.

"I have two buyers who use terminals to punch up sale orders, then buy on teleauction, and after the sale the computer terminal will print out a billing."

It seems only a matter of time before the availability of computer terminals makes computer auctions possible for all livestock sales.

To help spur the coming of that day, Extension Service-USDA has funded a special needs project in which a Virginia Tech Extension team will visit four states in August 1982 to spread the news about computer auctions and explain how to make them work. These seminars to be held in Atlanta, Chicago, Oklahoma City, and Salt Lake City will also feature local experts in electronic marketing. Each seminar is being cosponsored by the host State Department of Agriculture and industry groups. □

Minnesota EXTENDS Information

David M. Nelson, Program Director
Computer Information Systems
University of Minnesota

More than one cynic has pointed out that the real danger of computers is not that they will be able to think like people, but rather that people will begin to think more like computers and try to make the answers easier than they are.

Anyone engaged in the process of implementing a computerized support system for delivery of educational programs can testify to the challenges involved in designing an effective educational network. It's much more complicated than plugging in variables and processing options. Creative decisionmaking will be required as Extension educators decide, often with insufficient information and under severe time and dollar restraints, how they wish to make use of this technology.

The best way to assure strong momentum in the desired direction is to have a clear vision of that desired direction and, as Minnesota found, that's the hard part.

The acronym EXTEND (Extension Education Network and Database) describes the objective of Minnesota's computer network and library of educational software programs, as well as names it. The system, currently being designed, will enhance the Extension worker's ability to provide improved educational programs, more current information, and more indepth answers to problems confronting clients today. When completed, the system will consist of a network of terminals and host computers.

Assessing the value of a computer system is an involved task. Users' needs must be compared with capabilities available through alternative systems, and constant consideration must be given to the associated costs for implementation and use. In Minnesota, the pilot study undertaken in 1981 helped us determine six areas in which the computer would be of value to Extension.

These major functions were identified: decision aids, tutorial programs, informational data bases, communications, office management, and computer graphics.

Decision-Aided Instruction
Of these six functions, decision-aided instruction is by far the most common use of computers in Extension education today. With this method of instruction, the computer is used to query the student for a series of input values that are used within the computer program to provide a solution to the problem being addressed.

The educational value and usefulness of this method of instruction is enhanced by allowing the student to change the inputs for iterative runs of the program. This process provides the student with alternative solutions and instructs him or her about the impact each variable has on the problem. For example, using the computer in this fashion, the prospective homeowner can see easily that the monthly payments on a 30-year, $60,000 mortgage loan will increase from $615 to $759, with a change in the interest rate from 12 to 15 percent.

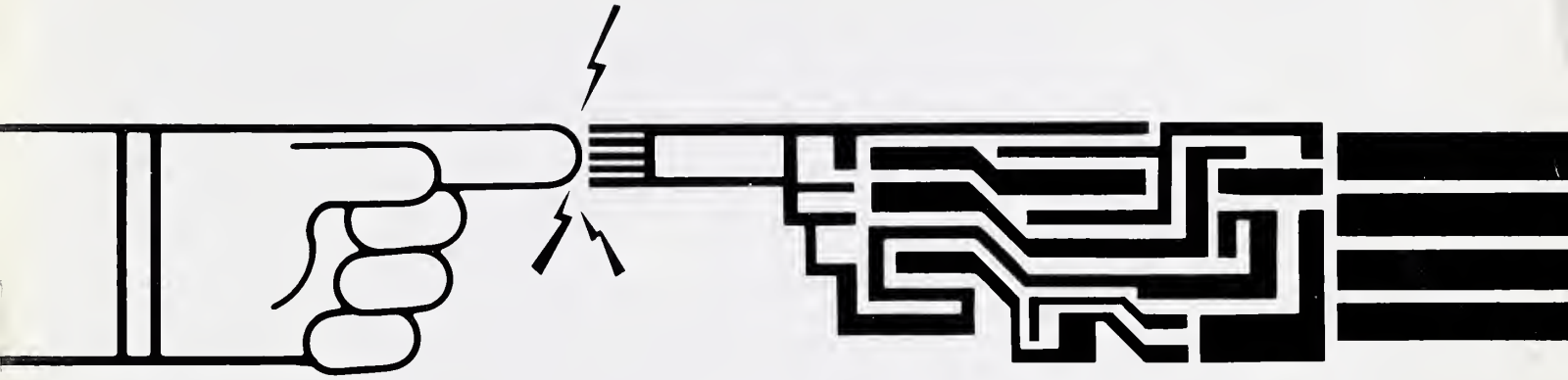
People setting up computer decision-aided instruction usually assume that the student is fairly well informed about the subject matter the program is addressing. If not, the student will soon encounter difficulty in answering the questions being requested of him or her by the computer. At this point, a tutorial program becomes helpful.

Tutorial Programs
Tutorial programs are designed to teach students a given subject. This method of teaching has been used effectively in elementary and secondary schools in teaching subjects such as math, grammar, and spelling. Its effectiveness in teaching advanced subjects and managerial skill has been less conclusive. Using this method of teaching, students learn through reading screens of text as one would from a book. Periodically the computer questions the student to help determine comprehension and to identify the most relevant points.

Tutorial and decision-aided instruction can be used together effectively within an Extension program to both inform and aid the decisionmaker.

Informational Data Bases
The concept behind an informational database is that the computer is an effective device for storing large amounts of numeric and textual data that can be searched and retrieved effectively and efficiently. In Extension, the use of the computer as a depository for fact sheets, bulletins, newsletters, advisories, and other textual information to be retrieved by subject, author, date, and keywords in the text, holds exciting possibilities. The establishment and usefulness of the data bases need to be evaluated for their cost effectiveness, compared with traditional methods of storing bulletins, using the telephone to obtain information, and looking up information in a book.

Communications
Computer communications entails the ability of computers to send data back and forth, and to store that data for access by authorized users at any time. The major advantage of this system of communication versus the telephone is that the person sending the message and the intended recipient need not be present simultaneously. The advantage of this system over a letter is that computer communication is faster. A message sent across campus or



across the country is received and stored in the computer within seconds.

Computer communication is currently being used in many forms, including accessing weather and market data, news releases, electronic mail, and computer conferencing. Extension faces the challenge of developing ways to use this new technology in the teaching and learning process.

Office Management
Word processing is the typical example given of using the computer in Extension for office management. However, equally valuable uses include maintaining mail files, 4-H enrollment records, budget and account transactions, time accounting records, staff directory updates, and mailing-label generation. Computers have a proven record as useful tools in these types of office management work. However, a conflict between office and educational uses of the computer might well arise in the Extension agent's office and a clear sense of priority will be essential.

Computer Graphics
Computer graphics are often thought of as useful only for designing computer games or as a means of entertainment. Although graphics can entertain, they can inform people in a way that no report can. Most people can be intimidated by the profusion of numbers in a typical computer report. Not only do graphics attract and maintain the user's attention, but they also help process numeric data, interpret it, and make it easier to understand.

Microcomputer Selection
The most critical factor in selecting a microcomputer for Minnesota's EXTEND project was its usefulness in meeting the six needs described above. After an extensive analysis of the many alternative systems, we chose the IBM personal computer because of its diversity of application, potential for expansion, and ease of use. Two models of host-dependent terminal decwriter and the Texas Instrument 820 were selected based upon their reliability, portability, rate of data transmission, and cost.

"Intelligent" terminals (microcomputers with telecommunications) or "host-dependent" terminals (a terminal requiring host computer support) will exist in each county and area office and in each Extension department on campus. The type of terminal (intelligent or host-dependent) selected for an office will depend on communications costs and uses of the equipment. Each terminal will have communications access to the university's on-campus host computer and to other computers throughout the United States. Extension's clientele will access EXTEND by going to the agent's office or through their home computers.

Implementation of the EXTEND network covers a 6-year time frame which began in July 1981. The ability to stay on schedule will depend in large part on the availability of county and state funds. Today there are host-dependent terminals in 17 of Minnesota's 87 counties, 10 area offices, and 22 campus offices. Ten more host terminals will be added during FY-1983. Microcomputers are located in 5 counties, 4 area offices, and 10 campus Extension offices. Six additional micro's will be added during FY-1983.

Staff Training
Staff training in the use of computers for Extension work is as important as the hardware selected or the software developed. Staff training in how to operate the equipment is, of course, the first essential step. However, the more difficult and creative work will be in developing methods of using the computer to enhance existing Extension programs. The computer should be thought of as a tool for assisting in the delivery of an educational program just as we now use overhead projectors and other equipment.

Extension staff members will need to develop most of the software useful in Extension educational program delivery. State Extension specialists will do much of this work, and it will require a strong commitment from them plus the support of their administrators.

A computer system will be useful to Extension only if the right combination of good software, appropriate hardware, and a well-trained staff are brought together. Perhaps our greatest challenge will be to keep a sense of balance in developing at an optimal rate in all three of these areas. □

Better Analyses— Better Tomatoes

T.B. Jurchak, Senior Extension Agent, Lackawanna County
B.W. Kelly, Professor of Farm Management Extension
P.A. Ferretti, Association Professor of Horticulture Extension
The Pennsylvania State University

Using a recently developed program for tomato production and marketing analyses, growers in Lackawanna County, Maryland, have identified and adopted practices that have increased their income $145,000. Factors such as production costs, quality, yield, size, and price can be examined separately and in combination to determine their effect on returns.

Rapid Analysis Needed
Producers of fresh tomatoes face increasing costs plus more complex production, harvesting, and packing decisions. Growers need information to evaluate each part of the process from planting to selling. Too often in the past, with the intense activity of harvesting and marketing compressed into 6 weeks of 24-hour days, everything became a blur of tomatoes out of the field, then into and out of the packinghouse. There was little time for meaningful examination of separate parts of the process during the harvesting and marketing season when it was needed most.

Only after the total crop was gone did growers have time for evaluation, but by then they lacked some of the information needed for accurate decisionmaking. Thus, conclusions were drawn from incomplete or misleading recollections. In addition, other farmers considering entry into fresh market tomato production and marketing needed budgets to guide them in decisions for managing capital and labor.

Procedures Outlined
Developed over the last 3 years with the cooperation of growers in Lackawanna County, the computer program now provides pertinent information for evaluation immediately after packing. As soon as a field is picked the first time, the grower completes a "Producer Reporting Form" that includes information on the amount of tomatoes harvested and the resulting "pack out" in terms of grades, sizes, and prices. This information is telephoned to the university's farm management extension section where a computer program has been prepared to accept the data and print out a "Tomato Marketing Analysis Report" that is mailed to the grower. This report includes production, harvesting, packing, and marketing costs in total and "per acre."

Costs have been developed from grower surveys and averaged for use in the program. Gross income is determined from the actual yields, "pack out," and prices reported by the producer on the "Reporting Form" and reported in dollar value and number of boxes packed, by grades and sizes. These data give the grower immediate information on yields from the field, percent "pack out" of 30-pound boxes, cull rate, distribution of grades and sizes, and the proportion of income produced by each. Also provided is a summary of expenses and receipts for each field as well as the net income.

Each Picking Analyzed
The process is repeated for each picking from each field so the grower has a continuous account of how well or how poorly each is performing in relation to other fields on the same farm. After the crop is sold, the grower gets a summary of all the information obtained from his farm during the marketing season. This summary contains figures by fields, varieties, grades, and sizes so the grower has complete and accurate information for evaluation. In addition, growers receive summary information on varieties used by *all* growers, to use for variety selection the following year. During 1980 the program included 666 acres of tomatoes. Its value has been demonstrated for management decisionmaking as well as for educational and research direction.

A similar analysis program has been developed for use with a hand-held programmable calculator and a printer so a grower has the information as soon as the tomatoes are picked and packed.

Year-end Summary Valuable
Following each picking, the data are sent to the farm management extension section at the University of Maryland. There, the data are accumulated and a year-end summary is produced. Based on this information, growers can make decisions for the next production year.

Strong and Weak Aspects Visible
Armed with such analyses, growers can easily translate production practices, variety selection, yield, size, quality, and packinghouse efficiency into maximum net income. They can make adjustments, if needed, in their production, harvesting, and marketing program. They also know immediately if prices are covering their costs and providing a profit, or if they should seek other markets.

While there is still time for decisionmaking and changes, producers know whether the crop is profitable or if they are selling tomatoes for peanuts. □

AGNET— American Network for Agriculture

Duane A. Griffith, Extension Specialist, Economics
Montana State University
and
M. Anthony Wright, Extension Computer Coordinator
Washington State University

"A very user friendly interactive system. . . ."

A computer expert might describe AGNET that way—and so might many of those who have put its electronic memory to work for them.

The AGNET computer system is "user friendly" because it can be easily understood and used by those new to computers. The computer types out a question and the user responds by typing out an answer. If the computer questions are not understood a HELP option with additional explanation is available. The ease of use and flexibility of AGNET has stimulated its rapid development since its beginnings in the mid-seventies.

Technically, AGNET is designed to deliver management tools and information to individuals and organizations concerned with agricultural production. It is currently providing business producers, farmers and ranchers, educators, and CES specialists with the data essential to them.

In 1981, use of the AGNET system approached 80,000 hours of combined connect time by the Cooperative Extension Service and external users. Although CES have the highest hourly usage, there are more external users than Extension users. The AGNET system is now accessed by 37 states in the United States with users also located in Canada and other foreign countries.

Transparent System

AGNET is designed around several fundamental principles, the first of which is that AGNET users are not expected to know anything about computer operations. People access the system to obtain information—not to learn about computers. For this reason, the system was made "transparent" so that it will not stand between the user and the information being sought.

AGNET's library consists of more than 225 programs. These programs divide into three major categories. The first contain the *analytical* or *"problem-solving"* programs. These "management model" programs deal with a single major problem such as balancing an animal ration or estimating income taxes. This program area accounted for 67 percent of total use of AGNET in 1981.

Because approved methods of agricultural production are extremely localized, AGNET allows localized information and program variants to be accessed by users.

The second major category is *market information delivery*. Agricultural commodity prices and information concerning commodities change from day to day and hour to hour. Users tap into a marketing program to obtain the latest information exactly when they need it.

The final category—*electronic mail*—permits users to freely communicate with each other; this aspect of AGNET encourages "conferencing."

Partner States

Currently, there are six major partner states participating in AGNET: Nebraska, Montana, North Dakota, South Dakota, Washington, and Wyoming. Partner status allows each of the partner states to modify existing programs and place new programs on the system.

This partnership offers the advantage of a pooling of resources where the programs written in one state will be used in another. Currently, more than 45 staff years of programming have gone into AGNET. And it is estimated that a period of time equal to this has been expanded on AGNET by nonprogramming subject matter specialists or faculty.

Decision Aids

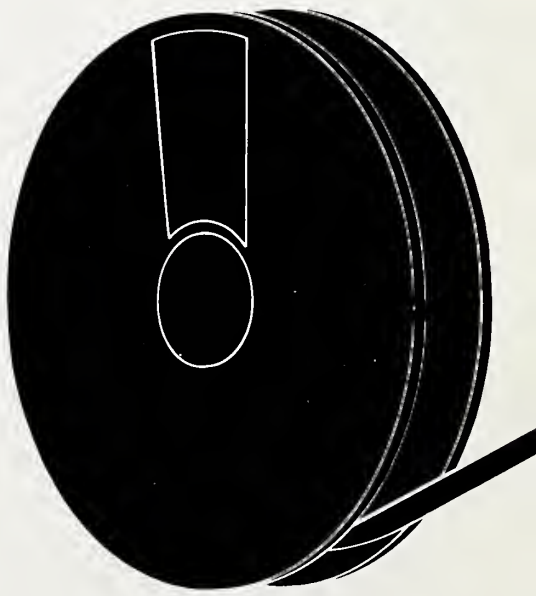
In the midseventies, James Kendrick, professor, extension marketing, and Tom Thompson, agricultural engineering department, University of Nebraska-Lincoln initiated work on development of the AGNET system. They saw a need for computer-assisted decision aids so that producers and those in agribusiness could make major changes in operations and be assisted in their daily management decisions.

After searching for an easy-to-use system, Kendrick and Thompson decided to develop one from the ground up rather than make adaptations to existing systems.

User Friendly

In 1975, AGNET was introduced in Nebraska for use by the CES staff. For 2 years, the development of the system continued with the addition of more computer programs and greater ease of operation.

Features were added to make AGNET more "user friendly." For



example, for the more complex programs, an option was provided to save a given set of data; this storage ability allows the user to run the same program at a later date with the same basic information at hand. There is no need to re-input data. Many similar "user friendly" features were included.

Since its inception in 1975, the AGNET system has grown considerably. And continued growth is expected within the states now on the system. The system allows for growth because other states can sign agreements with Central AGNET and become full-partner states—or simply buy time through one of the states currently on the system.

Western Teamup
In 1977, the Old West Regional Commission, composed of governors from the states of Nebraska, North Dakota, South Dakota, Wyoming, and Montana, authorized grants of approximately $2 million to set up the AGNET system in these states. In the fall of 1977, the Old West Commission states implemented AGNET. Funding from the Commission continued about 3 years, ending in June 1981.

AGNET programs, which covered a wide range of topics, were computational and agriculturally oriented. Users provided information about their specific operations to tailor results to fit their needs.

Producers could run any of the AGNET programs by contacting County Extension staff and arranging for a demonstration of the system or some detailed analysis of their operation. Since last June, when Old West Commission funding ended, all states on the system have started charging user fees.

Adopted by Washington
In mid-1980, the state of Washington, which was not a member of the Commission, decided to adopt the AGNET system. Computer terminals are now installed in county Extension offices throughout the state. (See story on AGNET in Washington on p. 13.)

Self-Supporting
The five original states in the AGNET system received support from their respective state legislative groups after the Commission funds expired in 1981. Each state's longrun goal is to make the system self-supporting through charges to the end users.

The AGNET system has continued to grow and become even more "user friendly." It contains over 200 programs which cover such areas as home economics, agriculture, 4-H, community development, nutrition, health, clothing and textiles, and energy.

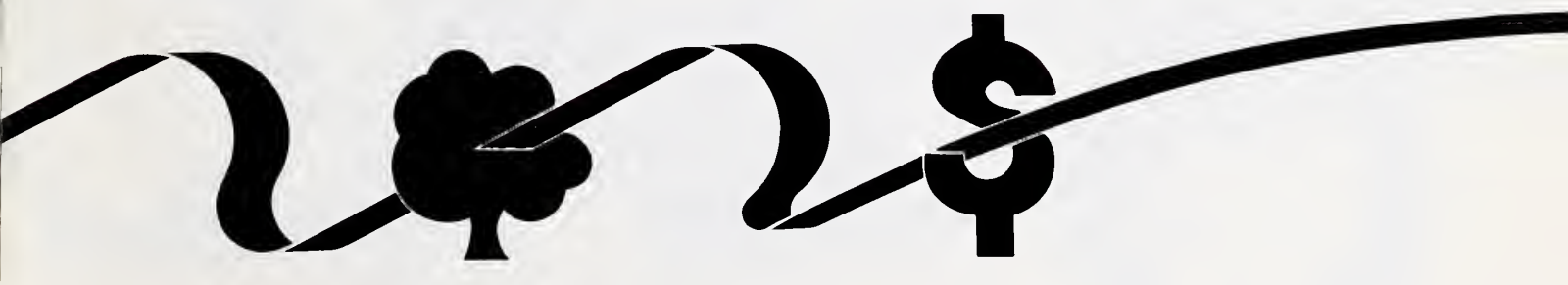
Over the years AGNET system managers have tried to stay in touch with the needs of users. This has brought about a change in the type of services AGNET offers. Along with the computational programs, there are now several programs in the system which provide information to users without their input. These programs provide information about the feeding programs for livestock, including weights at feeding, and average daily gains.

The MARKETS and NEWSRELEASE programs provide information on current cash and futures prices on agricultural commodities throughout the Midwest and Northwest.

The programs also provide up-to-date information on what the commodity markets are doing, trends in commodity markets and the short-run outlooks for the various commodities. In addition, the programs are an excellent source of information on topics of a timely nature.

Same-Day Service
One of the developments that has enhanced the ability of the AGNET system to deliver very useful information is the direct link to computers used by USDA. Reports that USDA generates daily or as necessary are loaded on to the AGNET system so that users have, in many cases, same-day service, and no longer must wait to get the USDA reports in the mail.

USDA's Foreign Agricultural Service (FAS) has implemented its own pro-



gram on AGNET, called FAS, which provides information on all types of commodities and trade leads on commodities wanted by foreign countries.

FAS contains up-to-date information on current crop and livestock production reports for the United States and countries around the world, export outlook and sales, reports on outbreaks of disease or drought, and reports on current legislation dealing with farm and commodity programs.

Popular Mailbox

The most general informational programs available on AGNET are MAILBOX and CONFERENCE. The MAILBOX program is also the single most widely used program on AGNET. CONFERENCE allows communication on a specific list of topics with the ability to add or delete topics as necessary. People who are interested in learning more about a specific topic can receive conference notes and contribute to the ongoing conversation.

Some general CONFERENCE topics include marketing, energy, community development, and use and application of computers. MAILBOX allows users to communicate with other users individually or to groups of people on mass mailing lists. MAILBOX has no specific topics and users can send or receive information on any subject. This makes the program a very effective communications tool.

MAILBOX keeps the County Extension staff in touch with State specialists and groups or organizations in touch with each other, government agencies, or specialists. Any one else who wants to access and use the AGNET system can use MAILBOX to communicate with other users.

Initially, users were required to access AGNET through County Extension staff. Now anyone who has their own computer terminal or is willing to purchase computer equipment or a micro-computer can buy time from one of the states listed previously. With the advent of micro-computers, and their cost effectiveness, many people have purchased their own computer equipment and are buying time from AGNET. There are now more external users than Extension users.

Users range from 4-H youngsters learning the effects of their lifestyle on their future health to foreign embassies getting the most current information on estimated world wheat production.

Agricultural lending institutions use the system to help analyze the feasibility of loans for machinery, equipment, and land purchases as well as operating loans. Agricultural consulting firms also use AGNET to assist their clients on topics that range from calculating a simple loan schedule to decisionmaking on the timing of irrigation systems.

If you would like further information about the system, and the programs that are available or how to sign up, contact one of the state supervisors listed below:

MONTANA—Duane Griffith, Supervisor, Linfield Hall, Montana State University, Bozeman, MT 59715 (406) 994-2580

NEBRASKA—Pat Ebmeier, Users Services Supervisor, 105 Miller Hall, University of Nebraska-Lincoln, Lincoln, NE 68583-8713 (402) 472-1892

NORTH DAKOTA—Dave Rice, Manager, Morrill Hall, North Dakota State University, Fargo, ND 58102 (701) 237-7381

SOUTH DAKOTA—Don Peterson, Supervisor, Department of Economics, South Dakota State University, Brookings, SD 57006, (605) 688-4141

WASHINGTON—Tony Wright, Coordinator, 303-A Ag Sciences, Washington State University, Pullman, WA 99163 (509) 335-2511

WYOMING—Harlan Hughes, Coordinator, 117 Agricultural Building, University of Wyoming, Laramie, WY 82071 (307) 766-4377 □

AGNET in Washington State

M. Anthony Wright
Extension Computer Coordinator
Washington State University

Get a good system . . . train those who will run it . . . and put the system to work as soon as possible.

These have been the goals of Cooperative Extension at Washington State University (WSU-CE) since implementing AGNET, the agricultural computer network.

In mid-1980, Cooperative Extension at WSU became a full partner in the AGNET system. Currently, computer terminals are installed in all 39 county Extension offices and approximately 90 percent of WSU-CE county faculty have each received at least 3 hours of "hands-on" instruction. Programming efforts have been productive with the completion of seven major programs and many others rapidly nearing that point.

Background

AGNET is an agricultural computer network that began at the University of Nebraska in 1975. Since then, AGNET has grown to over 3,000 users in 35 states, Canada, and other foreign countries.

Technically, AGNET is an interactive system designed to deliver management tools and information to individuals and organizations concerned with agricultural production. It uses standard equipment and the IBM-CMS operating system and users can access it through any standard computer terminal.

AGNET is designed to be "user friendly"—this means AGNET users are not expected to know anything about computer operations. The system was planned so it will not act as an impediment between the user and the information he or she wishes to obtain.

AGNET consists of a library of over 225 programs that are divided into three major categories: problem-solving programs, market information delivery, and conferencing through electronic mail.

Currently, there are six major partner states participating in AGNET—Montana, Nebraska, North and South Dakota, Washington, Wyoming. Partner status allows a state to modify existing programs and place new programs on the system. For a more thorough look at the AGNET computer system see "AGNET—American Network for Agriculture" in this issue on p.10.

Early Staffing

For the first 6 months as a partner state, Washington AGNET was without full-time support staff. Two state leaders for community resource development—James Barron and Arlen Davison—volunteered a portion of their time to AGNET. M. Anthony Wright became the state Extension computer coordinator and the first member of the permanent staff in November 1980. A second staff member—a systems analyst-programmer—was hired in January 1981 and is assigned to AGNET program development.

Three part-time programmers and three temporary subject-matter assistants (in animal nutrition, forestry, and agricultural economics) were hired later with funds from three grants totalling $60,000 for AGNET program development and modification. The funds, from USDA's Soil Conservation Service (SCS), were to develop AGNET soil and water conservation programs, adapt several AGNET programs to Washington, and establish data bases for certain other programs.

Three AGNET projects concerned with soil conservation and completed this year are PIPE, PUMP, and PNWSOIL.

PIPE was a modified computer program aimed at allowing users to quickly calculate the sizing of irrigation pipe in hilly country.

PUMP, a modification of the PUMP program, gave the data for gravity-pressurization of irrigation systems.

PNWSOIL was a program that offered a modified "universal soil loss equation" for predicting soil erosion in Washington.

Telecommunications
Initially, users would dial long distance commercially to input the AGNET computer located in Lincoln, Nebr. The installation of a statistical multiplexer (an Infotron 680) increased dialup ports from six to eight. In 1981, "incoming-only" WATS lines were installed for county faculty. It has been estimated that this shift to WATS lines, with their reduced rates to multiple users, has saved Extension at WSU at least $1,500 per month since their installation.

External Users
Usage by month of Washington AGNET rose from 350 hours in August 1980 to 450 by January 1982. And usage increased an additional 10 to 15 percent during the first quarter of 1982.

"External" users of AGNET—individuals and institutions associated with WSU—pay the full computer and telecommunications costs of their AGNET usage. As of January 1982, these "externals" accounted for about 25 percent of total Washington AGNET use.

The major users include specialists from SCS, members of major agricultural lending institutions, consultants, farmers, and ranchers, mainly in Washington, Idaho, and Oregon. SCS has placed terminals in nearly every one of its local or area offices throughout Washington and accounts for a large share of users and time on the system.

The Extension program at WSU currently accesses about 2,300 programs per month and external users account for 1,000 of this total.

Meaningful Analysis
A trend noted in Washington AGNET usage is the continual decrease in the number of programs called per hour. This means users on the faculty at WSU are taking *longer*—not less time—to run a program. This has surprised some staffers because users were expected to decrease amount of time they took to run a program when they gained proficiency.

Why are they taking longer? One speculation is that these users are doing more substantive analysis when they call a program. And this takes more time than the "exploratory encounters" with the computer that are typical of the earlier learning months.

Volcano by Mail
The AGNET system has been used in various ways by the Extension faculty at WSU. One of the earliest uses was electronic mail.

When Mt. St. Helens "blew its top" on May 18, 1980, electronic mail was used to communicate between counties and the WSU campus at Pullman. Information about the disaster and county and state recommendations dealing with it reached Pullman even as the volcanic ash began to mushroom over the area.

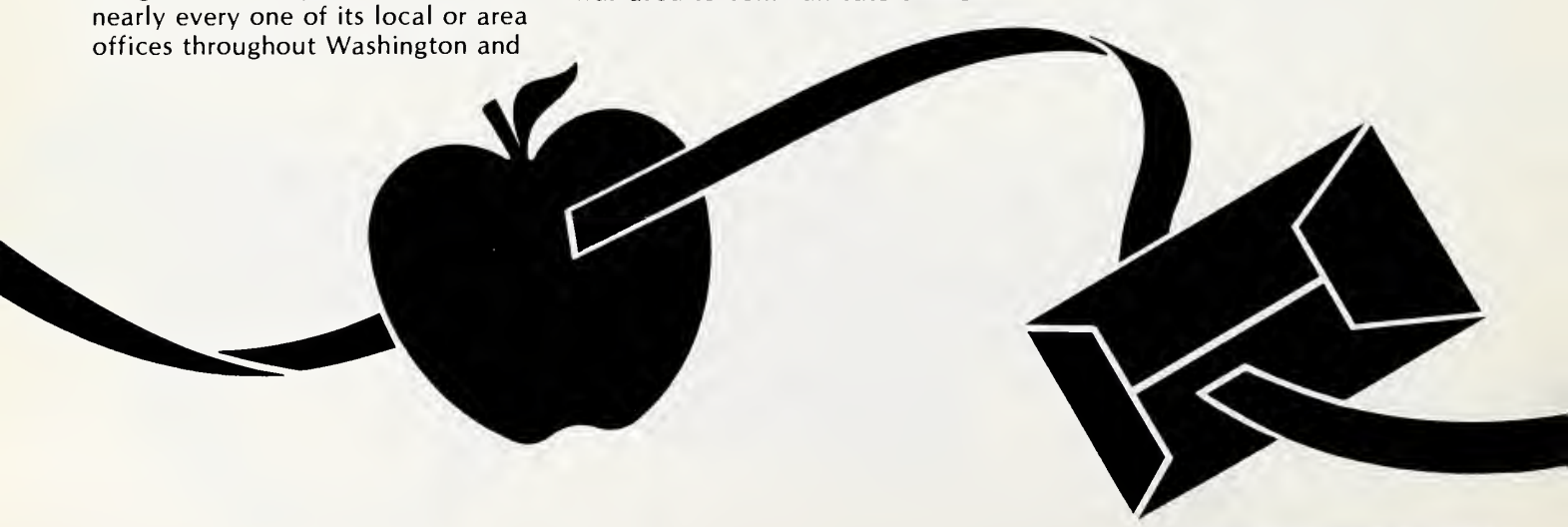
By early the same afternoon—less than 4 hours from the moment of eruption—information about the disaster had been collated and sent by electronic mail to the U.S. Department of Agriculture in Washington, D.C.

Later, information was collected from county offices every Friday morning through electronic mail, keeping current the account of the continuing disaster.

Electronic mail had—in dramatic fashion—demonstrated the rapid transfer of current, vital information.

Teachable Moment
One county faculty member, involved in beef herd performance testing, was able to run an analytic program from a rancher's home telephone. The AGNET program allowed him to get immediate feedback of test results.

This quick feedback let him give a thorough explanation of the principles of beef herd improvement—



what he called a "teachable moment." He believed he would not have had this impact if he had followed traditional methods and used a hand calculator. This, he said, would have meant a delay of several days or a week.

Potential Careers
Another WSU faculty member has used AGNET's JOBSEARCH program to educate low-income minority teenagers about the variety of potential careers they can later pursue. The youths were informed of the skills needed to qualify for different careers.

This information, coupled with job availability reports in the state, helped to round out the career education program.

Program Variety
FEEDMIX, for which a Washington feed database has been established, has proved useful to beef producers. Using the program's least-cost animal ration balancer, producers have learned new aspects of animal nutrition, especially concerning feed substitutes.

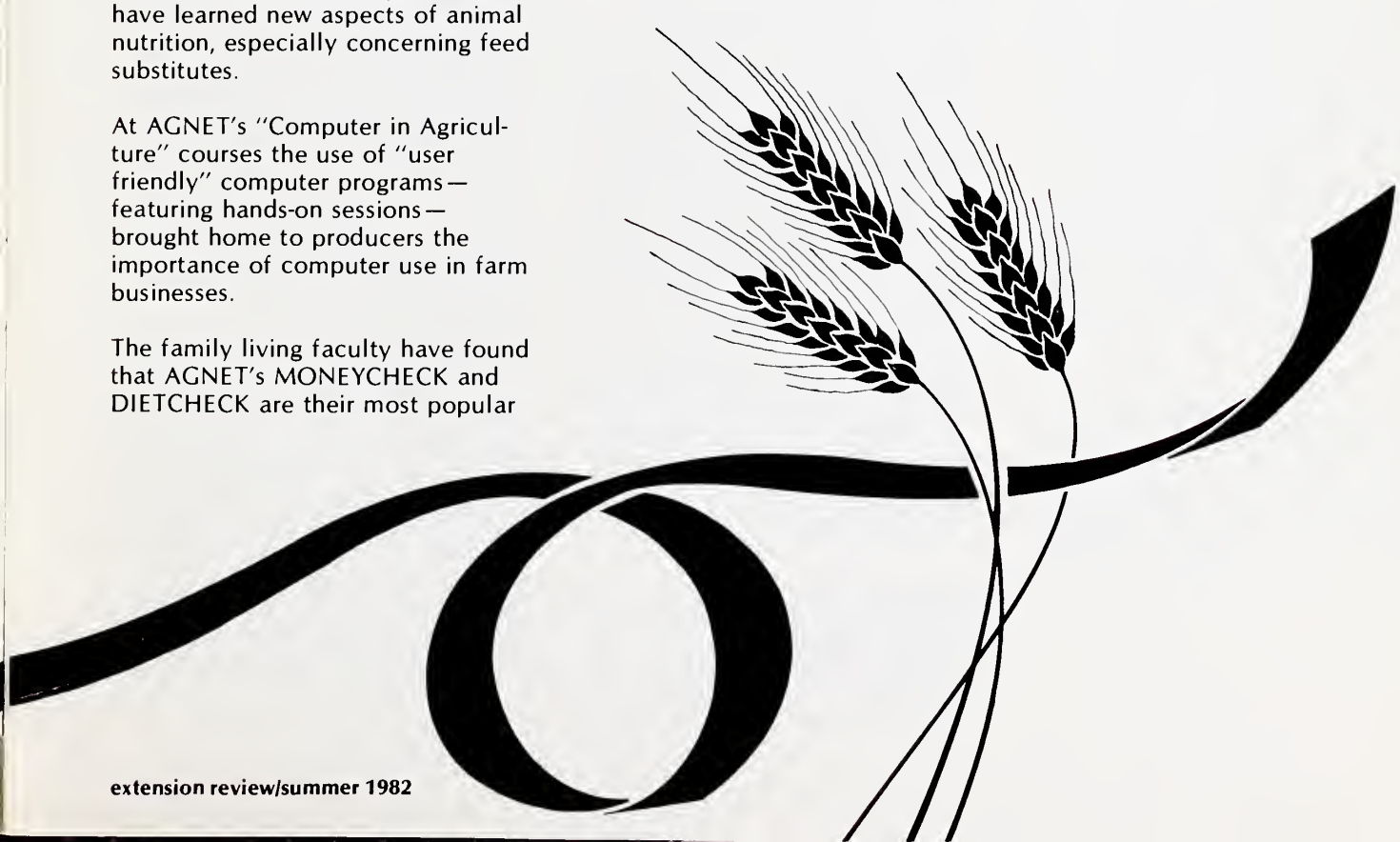
At AGNET's "Computer in Agriculture" courses the use of "user friendly" computer programs—featuring hands-on sessions—brought home to producers the importance of computer use in farm businesses.

The family living faculty have found that AGNET's MONEYCHECK and DIETCHECK are their most popular programs. MONEYCHECK is used in family spending and budgeting classes. The program analyzes personal spending patterns and compares them to national or state averages.

DIETCHECK has been used frequently by county faculty in their nutrition classes and has been used to check out the adequacy of "fad" diets.

Other popular family living programs are:
CARCOST (a cost-finder program for autos and trucks); FOODPRESERVE (a cost-finder program for preserving foodstuffs at home); and FIREWOOD (a program that deals with economic alternatives of heating with wood).

Washington AGNET staff at WSU have plans for many new projects. The goal is to continue to be dynamic and productive in all future programming efforts. □



Breakthrough in Computer Budgeting

Veronica Carmack
Extension Family Resource Management Specialist
Clemson University Cooperative Extension Service

How many lives have we changed in South Carolina with our computer budgeting programs? It's hard to say. But many South Carolinians are better family budgeters because computer programs in money management began back in 1974 through an Extension Service-USDA special needs grant.

The initial program—called PLAN—was to be used with our mainframe computer located on the Clemson University campus. This comprehensive budget analysis program continues to be used as a tool to examine a family's spending pattern and expenditures for a 12-month period.

Early in the project some county agents asked for help developing a mall exhibit on money management. We wrote *Speedy Spend,* a simple computer program using a portable terminal as an attention-getting device. It was an instant success.

Extension agents quickly accepted *Speedy Spend* because it was easy to use and nonthreatening. Some agents had previously resisted doing any budgeting work because of the calculations involved. How much simpler to avoid mistakes in addition! Budgeting the old way took a long time to do on a calculator. Now, this surprisingly simple program could do it all for them. *Speedy Spend* was also a big hit with our clients.

On one occasion at a large mall in Greenville, a relay system was needed to move the large crowd through the line. First an agent would help a person fill out the 10-question input sheet before sitting down to the computer. As soon as the computer printout was completed, the agent would quickly tear it off and move out of the way to discuss the analysis with the client while another agent and client took their place at the keyboard. Quite a system. It takes teamwork. But, when all the agents in an office, in both agriculture and home economics cooperate, it works. After the ES grant money was gone, we had to decide how to cover the cost of telephone charges and other expenses connected with the use of remote terminals.

Bank Involvement

Contacts were made with the Women's Division of the South Carolina Bankers Association. After presentations to "sell the product," *Speedy Spend* became a project for these bank officers. An article was published in their state magazine, the *Palmetto Banker.* Each bank in the state was invited to work with their local Extension office to set up computer budgeting exhibits in their lobbies. In many cases, the banks went the extra mile by providing publicity, printing posters, and giving their employees an opportunity to serve as volunteers on the days we were with them. In exchange for our service to their customers, the banks agreed to pick up the tab for all expenses incurred. It was a good experience for all. We still use this approach in counties that don't have their own computers.

In September, 1981, South Carolina received a grant from the Kellogg Foundation. One provision of that grant is to place microcomputers in county Extension offices—a marvelous opportunity to use computer technology in all areas of Extension work.

It didn't take long for us to transfer our *Speedy Spend* program to BASIC. That's the computer language used on the Radio Shack TRS-80 computers in our project. At this time, we are using both Model II and Model III TRS-80's. Staff members in counties with Model II's are happily converting all their mailing lists and much routine office work to the age of technology.

Our updated version of *Speedy Spend* goes a step further than the original. We still ask for a minimum amount of information. Soon the client is presented with a budget which uses both state and national figures for comparisons with their own guesses, then the client can revise the budget from scratch using either the exact amount of money spent in a particular category or selecting an upper and lower range of numbers.

For example, suppose you aren't exactly sure of the amount you are spending per month on automobile upkeep. You might choose an upper limit of $60 per month with a lower limit of $25. After all the other budget categories are calculated, some number between these limits will be selected for that budgeted item. If your expenses were running pretty high, you would choose a figure closer to the lower limit. The point is, you have the option to set the limits yourself, or to suggest exactly what you expect to spend. A "tailor-made" budget is the result. All this in less than 30 minutes (27 minutes of "thinking" time and 3 minutes of computer time).

In shopping mall demonstrations, we don't revise budgets, but stick with the original *Speedy Spend.* If, however, a client has an unusual situation or needs additional financial planning, we can arrange to help more at a later time.

Financial Counseling

Individualized financial counseling is becoming more important to us. In many counties in our rural state,

the Extension home economist may be the only person available for people to talk with concerning financial problems. Group sessions have great value, but won't work for everyone.

Computers help to take away much of the drudgery connected with budgeting. Clients are impressed when they learn that Cooperative Extension is right on top of the current technology wave. Our credibility is respected and enhanced. When people stop by our exhibits at shopping centers, they may express amazement that we are involved in anything besides farming and canning. That's why we have been so pleased with our branch office at the Dutch Square Mall in Columbia, our state capital. The office has been effective in demonstrating Extension's practical assistance in financial planning for families and in other areas of home economics and agriculture.

Shopping Mall Office

Several years ago we decided to take our Extension programs directly to the people when they shop. We moved into a busy shopping center with a staff and fully equipped exhibit center. Every day except Sunday, our county Extension Service branch office opens from 10 a.m. to 9 p.m. We receive soil samples for processing, have special exhibits, demonstrations, and displays, show video tapes and answer a multitude of questions. Our monthly contacts average around 3,000 people. That's not just the "Hello, how are you" kinds of contact, but contacts where clients ask questions, receive leaflets, or watch demonstrations. In the near future, we expect to place a permanent computer in the branch office, instead of only having one for special promotions.

Special computer promotions are handled in a cooperative spirit through our contacts with Radio Shack stores. Most of our larger malls have these stores in them. If a county office lacks their own equipment, staff members can visit the local dealer to borrow equipment for a specific time and place. We supply the money management programs, personnel, and expertise and the store provides the equipment and the paper for the printouts. We are pleased and the clients are, too.

Navy Uses

Elizabeth Hill, Charleston Extension home economist, learned that *Speedy Spend* could be of great interest (and help) to Navy personnel. The U.S.S. Sierra at the Charleston Naval Base heard that Hill had used the computer money management program with an Air Force group. They asked her to "come aboard" and teach a group of 720 Navy personnel (while closed circuit TV cameras rolled). She also did one-on-one computer budgeting using the ship's computer. "I reached both men and women," says Hill. "From enlisted staff to the executive officer of the ship!"

The Navy doesn't fool around. They interviewed people who'd gotten help from Extension to see if the program was worthwhile. They received good feedback and made arrangements to call Hill for more help. "I told them that I want to train their volunteers to use *Speedy Spend* for counseling," she says. "I'm also working with a chief petty officer in the Charleston Naval Base dispatching office to see if other ships are interested." Meanwhile, Hill has been told that the videotape she did on the U.S.S. Sierra will be shown while that ship's at sea, and perhaps to crews on other ships.

Software Need

South Carolina has had numerous requests for copies of the computer programs developed by the state. At least 30 states have adapted the South Carolina money management program or have access to the program through a national computerized management network. When we receive a blank disk from a client, we copy a program onto it at no charge. That involves a certain amount of staff time and effort. We are working toward making all these programs available through a national timesharing network so that prospective users may transfer the program they need directly to their own microcomputer through a phone call.

The future in South Carolina is bright for growth in computer technology. Our county personnel are excited at being leaders and innovators in the field. As Extension professionals we use computer technology to better serve our communities and clientele. □

Future Waves in Communications

Betty Fleming
Agriculture Extension Specialist,
Home Economics
Extension Service, USDA

Nearly 700 communicators and communications-minded co-workers tuned in, live, to an audio teleconference held July 7, 1982 at this year's national ACE (Agricultural Communications In Education) meeting. Through this mechanism, 500 professionals "back home" shared in the momentum of 200 fellow workers at a conference exploring the depths of "Future Waves in Communications."

National professional meetings may never be the same again.

The ACE conference was an innovative step in a forward-thinking direction. Nineteen states were hooked up, via an audio teleconferencing network, to Biloxi, Mississippi, the site of this year's meeting for a 1½ hour teleconference on "Communication: Rocking The Boat . . . Without Sinking The Ship."

ACE is an organization of professional communicators who represent all media interests, information administration, research, teaching and international programs in agriculture, home economics, and related fields. The organization's first teleconference, dedicated to Les Schlup, ACE pioneer and former head of Extension Service Information at USDA, was made possible through a $5,000 grant from Extension Service, USDA. Larry Quinn, head of USDA's film and video services for the Office of Governmental and Public Affairs, was coordinator and moderator for the event.

The showing (at all sites) of a 30-minute videotape featuring remarks from three outstanding resource people preceded the teleconference. Jim Turner, a Washington, D.C., consumer advocate attorney, urged viewers to listen more to the trends and issues around them so that, as communicators, they can help to shape the future. Clement Bezold, a Washington, D.C., political scientist and futurist (Director of the Institute of Alternative Futures) described the options he sees for the future and how changing values will affect our future. He encouraged viewers to involve others in decisionmaking processes. Bill Harvey, publisher and editor of New York's "Media Science Newsletter," described some of the latest trends in communications technology.

By the time everyone around the country had viewed the tape, all were linked to a dedicated phone bridge and were ready to discuss together their questions and concerns. One time around for each site provided a wide range of questions, everything from: "How many cable operators are there now?" to "How do we set communication priorities?"

Interest and participation were high as the three resource people ably responded to each comment. "The fact that there were so many good questions and our speakers were broad-based enough in their knowledge to handle these questions were definite success factors for us," says Quinn.

All told, there were 28 state questions and responses (often from several resource people) during the 1½ hour Q and A period. It began with a brief discussion between Quinn and the resource people.

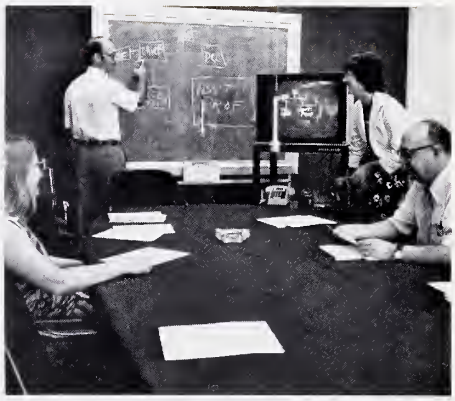
How It Was At State Sites

Judy Sorton, news coordinator, and John Totten, radio specialist, handled arrangements at the Indiana site. "We had about 26 people in West Lafayette, our staff office, plus eight area sites attended by about 70 people," says Sorton.

State and county comments were generally positive in Indiana, reports Sorton. "Some of our state people would have preferred live video but they understood the cost was prohibitive."

In some ways, extending the information to both state and county audiences posed challenges. "We had non-Extension communications faculty as well as our own information staff at the state site, plus some agents and Extension program specialists, says Sorton. "Some of these people had no idea of what ACE is."

Some of the Indiana field staff had technical teleconferencing problems; a few criticized the sometimes lengthy responses to questions and some found the information



Top left: Featured speakers at the national ACE (Agricultural Communicators in Education) meeting in Biloxi, Miss. were: (left) James Turner, D.C. consumer advocate attorney, and (right) Clement Bezold, a political scientist and Director of Alternative Futures, a futurist organization. Both addressed aspects of the teleconference theme: "Communication: Rocking the Boat... Without Sinking the Ship."

Left: Nineteen states were hooked up live to this year's national ACE (Agricultural Communicators in Education) meeting held in Biloxi, Miss. They were linked to the meeting through a harbinger of the future: an audio teleconference system.

Above: The audio teleconference facility at Beltsville's National Agricultural Library features an electronic blackboard. When someone writes on the blackboard, the image is picked up by television monitors at other facilities that have this capability. The NAL facility is available to all federal agencies, with priority use going to USDA.

theoretical as opposed to practical. "Here again, maybe in the future we have to do some additional preparation of diverse groups like this," says Sorton. "We can't expect everyone to be at the same point in the thinking process."

The Indiana administrators who chaired the area sessions said the teleconference helped county staff to "look at what is going on in the world" as opposed to strictly local concerns. Sorton says, "One idea for next year might be to hold followup sessions for county staff so they can discuss ways to localize the information." She also feels required preparatory reading would help, too.

Arizona's Guy Webster chaired the session in Tucson. "We only had four people," says news specialist Webster, "but one of them was our Director, Roy S. Rauschkolb. In a followup session with him, we discussed direct broadcast satellites (DS) and our need to pioneer with new technology. It was a good session."

Two of the four people in the Arizona group had been scheduled to attend the Biloxi meeting, but the budget crunch forced them to cancel 2 weeks before the meeting. "If it hadn't been for the teleconference," says Webster, "Arizona wouldn't have participated at all this year in our professional association's annual meeting."

Webster expressed surprise that the 2-hour session (including the tape viewing) held everyone's interest. "I would have thought just mostly listening would have been hard to do."

Members of ACE in Washington, D.C. were among those viewing the teleconference.

Other success factors for the session cited by ACE 1982 program chairman John Culp (TVA-Alabama) were the careful planning done by Quinn, with the help and advice of key ACE Board members and program planners, ACE President-elect Ralph Ballew, Mississippi, and Extension Service, USDA Information and Communications staff.

"Larry's letters to states were well drawn up, giving step-by-step information," says Culp. "Electronic mail helped us to involve states and get quick feedback from them."

How It Began

The history of this large-scale project began in the summer of 1981 when Extension Service, USDA information staffers began thinking of ways to follow-up the first national Extension video teleconference held November 20, 1980. It was recognized that funds for such federally-funded video events would be limited in the future. The question was, how to pool available resources and keep the "new era" communications momentum going?

At the same time, contacts were made with ACE leaders Culp and Ballew who were planning the 1982 ACE national meeting. Ovid Bay, Extension Service, USDA, Information and Communications Director, requested financial support for an Extension Service sponsored ACE teleconference from Mary Nell Greenwood, Extension Service Administrator. In September 1981, Culp, Ballew and Judy Sorton (Indiana) from the program committee spent 2 days in Washington, D.C., talking to USDA information and program staff, Quinn, and Indiana Extension editor Eldon Fredericks on assignment in Washington, D.C., at the time, and conferencing with their counterparts by phone. A tentative plan was drawn up and communicated to the ACE Board in December, 1981. Input of key state people such as Roy Blackwood, Illinois, helped to shape the final product.

"Networking was another success factor," says Quinn. "My wife Christine, an information staffer for Farm Credit Administration, helped me get the name of resource person Clem Bezold from a USDA Food Safety Inspection Service (FSIS) contact at a Women In Communications Meeting. When I called Dr. Bezold, he provided me with the names of Jim Turner and Bill Harvey."

Some Other Plusses

Gearing up for teleconferencing at this year's ACE meeting had side benefits, too. Several other sessions, including one on cable TV with Suffolk County, New York, staff and from TV specialists (two in Biloxi and two in other states) and a home economics communications meeting were made possible because the teleconferencing option was in place. In years to come, perhaps more multiple use will be made of such options.

Locations participating in this event were: Alabama, Alaska, Kansas, Indiana, Illinois, Minnesota, North Dakota, Oregon, South Dakota, Utah, Washington, D.C., South Carolina, Washington, Idaho, Arizona, California, Texas, Canada, Pennsylvania, Delaware, and (Biloxi) Mississippi. In addition, Bill Harvey was on line from New York City.

Plans for the Future

New ACE President Ralph Ballew says he'd like to see innovative use of new technology such as teleconferencing at future ACE meetings. "We've got to involve members in national and regional meetings even when they can't attend," says Ballew. He and ACE '83 program chairman Roy Blackwood are exploring possibilities for funding the technology aspects of the '83 national meeting.

Localized Followup Possible

"State agent associations may want to check with their Extension editor to see what materials are available for meetings from this year's ACE meeting," says Ovid Bay. "Mississippi videotaped some sessions; the teleconference videotape is available; so are audio tapes of the teleconference. Also, the Southern States put together a tabloid describing this year's meeting. In addition, there's a written transcript of the teleconference tape and an evaluation report being prepared. All in all, there are a lot of multiple use materials which could be localized in a state or area discussion group setting." □

Video Conference Network SEEN Nationwide

Lorne A. Parker
Director of Instructional Communications Systems
University of Wisconsin-Extension

University of Wisconsin-Extension, an international leader in teleconferencing since 1965, will launch the world's largest dedicated freeze-frame videoconferencing network this fall.

Lorne A. Parker, director of Instructional Communications Systems at UW-Extension in Madison, is purchasing 30 freeze-frame video units. Extension's experience in teleconferencing, says Parker, means that the equipment—which can "freeze" a picture of nearly any object and transmit it to other locations—will be used to its fullest potential.

For the past 2 years, Extension has participated in interactive video seminars with students at New York University. And each year, approximately 40,000 people use its teleconferencing system, one of the largest in the world.

The freeze-frame units should be installed by July 1, says Parker, and by September they should be operational, benefitting the students and instructors on Wisconsin's Statewide Extension Education network (SEEN).

Networking

That network, one of several interactive delivery systems operated by Extension, interconnects 25 Wisconsin cities for continuing professional education and administrative communication. SEEN enables residents throughout Wisconsin to take courses, sometimes originating hundreds of miles away, in their own communities.

Teaching subjects such as engineering, business, and mathematics requires both audio and visual instruction. UW-Extension, says Parker, sees the need to coordinate audio and visual information and, through 17 years of experience, has developed techniques to accomplish it.

Through the use of leased telephone lines (making a private, or dedicated, network), SEEN students and instructors can communicate with each other while viewing visual material designed by the instructor. The new freeze-frame equipment will improve the visual instruction, now provided by electrowriters. With electrowriters, instructors' written diagrams are carried over telephone lines and are reproduced on distant classroom screens.

Equipment

Freeze-frame equipment, which is also referred to as slow-scan, gives an instructor more flexibility—a broader use of visual materials and a smoother coordination of audio and visual instruction. Using a standard closed-circuit television camera, still images of objects, photographs, slides and schematics, for example, are transmitted over a telephone line to a black-and-white television monitor in the classroom.

SEEN (Statewide Extension Education Network), a computer network for continuing education and administrative communication, operated by Extension at University of Wisconsin, has been enhanced by 30 new freeze-frame teleconferencing units. Lorne A. Parker, director of Instructional Communications System at UW, is shown at one of the new units he was instrumental in purchasing. Marcia Baird, associate director, assists him.

The videoconferencing system will also aid administrative meetings, which often deal with budget and planning issues. With the new equipment, Extension administrators can show visual information such as charts and graphs to supplement discussion.

A major plus in the units says Dennis Gilberston, director of engineering at ICS, is their two-frame memory capability. The instructor can send two images, or frames, to the remote site; one is held in storage. Instead of a usual 30-second delay in transmitting frames, the instructor can show the second frame immediately after the first or switch between the two. A third frame can also be sent to replace the first.

Among Extension's other teleconferencing systems are a dedicated audio network linking 200 locations statewide, a meet-me bridge for dial-in conferencing, and satellite/cable links to receive national videoconferences. □

Computer-Based Typesetting System—A Success

Anne S. Pease, Publications Editor
Deborah M. Turner, Assistant Publications Editor
Larry R. Whiting, Chairman, Department of Information and Publications
University of Maryland

In July 1980 the Department of Information and Publications at the University of Maryland decided to "go it alone"—to purchase its own typesetting equipment rather than continue to contract with outside typesetters.

Now, 2 years later, the department staff is confident it made the right decision. For a relatively modest investment, we now boast a computerized word processing-typesetting operation. The components of this operation are a Mergenthaler Omnitech 2100, a Xerox 860 word processor, a Xerox 820 personal computer, and communications modems connecting the three.

The first purchase was a Mergenthaler linotype laser 2100 typesetting machine. This typesetter uses 8-inch floppy discs as do most word processors. The program and type fonts are loaded on one of the discs. Having the fonts on the program disc means that at all times the machine could have at least 20 type faces on line simultaneously. Each face can be printed out in 246 type sizes ranging from 4½ to 127½ points. For this machine, a variety of type fonts plus math and pi symbols were purchased.

The machine can slant copy forward or backward 7 or 14 degrees. This capability eliminates the need to purchase italic sans-serif fonts—the machine makes its own. The machine both condenses and expands copy from 50 to 300 percent. One feature the department is just beginning to use graphically is the ability to reverse copy or even part of a single character, from black on white to white on black.

The Mergenthaler uses photo sensitive NCR paper which is developed in a P14 processor. The paper and chemicals are expensive, but the quality is wonderful.

Unforeseen Problems

When the department actually purchased the typesetter, several unforeseen problems were discovered. One immediate problem was that the University of Maryland had no job classification for a phototypesetter and that any classification that could be twisted a little to work did not pay a salary anywhere near that paid in private industry. Thus, the department had to hire an inexperienced beginner. Everyone learned at the same time. Next, the Mergenthaler required a separate room (noise and dust are a problem), with dedicated or separate power, nonstatic carpeting, and climate control. We had to make adjustments to accommodate these needs.

Once the typesetter was operational, we discovered we faced an incredible proofreading problem. The contracted outside typesetter proofed and corrected copy before it came to the department. This meant easy reading for the editors with an occasional typo discovered. Suddenly, we had an inexperienced typesetter and no proofreader. Along with this situation was the expense of performing initial proofing on expensive photo-typeset copy. Further, we still had a real production backup.

Word Processor

These conditions led us to the word processor and communications tie-in. The front end of the typesetting system is a Xerox 860 information processing system (word processor). There are an infinite number of word processors on the market today, but the department chose the Xerox for two reasons. First, the University of Maryland has developed a word processing master plan in an attempt to coordinate word processors purchased for the campus. In this plan, five companies were designated as preferred vendors. Xerox was one of the five.

The second reason for choosing Xerox was that it had several options we thought were important. The mandatory requirement was that the communications option would use the same language as the typesetter. Some vendors admitted they could not communicate while others claimed they could when, in fact, they could not.

The word processor has a 128K memory with its double-sided, dual-disc drive. This factor makes inputting long technical bulletins easier and keeping a disc library by type of publication more efficient.

Another extremely important option was a full-page display. The department planned to produce camera-ready copy for some forms, tables, and records with the word processor. Full-page display facilitates easier layout on the machine rather than cutting and pasting copy later. Xerox's full-page display is black on white rather than green on gray. Since the typesetter had the green on gray screen, the department had a year of testing eye strain to weigh its decision. The black on white is far more pleasant.

In Maryland, one minority audience the department works with is a growing Hispanic population. The foreign language option and Spanish print wheel were purchased to use in preparing publications for this group. There are seven languages on this program so it can be expanded merely by purchasing the appropriate print wheel.

Realizing the extra proofreading required through setting type, we also ordered the spell-check option. This software package is designed to find and highlight misspelled or suspect words in the processed copy.

The final option chosen was a conversion program so our Xerox 860

could read discs from a Xerox 820 personal computer used in the department's print shop for labeling and inventory use. This feature will facilitate keeping track of the inventory and helping us if the equipment is down.

Process

The publications secretary who was producing camera-ready copy on an IBM Selectric is the 860 operator. She is also the backup operator for the typesetter. She creates a conversion table for each job that is going to be communicated to the typesetter and types the manuscript accordingly. This table converts the word processor's command keys to whatever specific typesetting commands the job entails. There are character limitations to a translation table so coding still has to be done on the typesetter. Proofing of the word processed copy is a little bizarre, with strange symbols interspersed in the copy, but everyone seems to have adjusted.

To a great extent, we do our proofing and copy checking after copy is on the disc. Once the copy gets to the typesetter, the major concerns are with layout, coding, and hyphenation.

By adding the 860 on line, our keyboarding capability has increased by about 50 to 70 percent. Several things are not worth doing on the Xerox. Tables are difficult to set up and send and, once communicated, still take a lot of coding. Small bits of copy, short publications, and display type are easier to keyboard on the typesetter.

We linked the equipment via telecommunications because the typesetter is located too far from the word processor to be connected to it by hard wire. There are advantages and disadvantages to telecommunications. The department has only four phone lines for the entire staff of 22 persons. Communicating (dumping) ties up two of the four lines. Scheduling dumping for late or early in the day or at noon interferes less with the other sections of the department. On the plus side of the setup is the capability to communicate with other compatible equipment. For instance, Extension is establishing an ESTEL (Extension Service Telecommunications System) system in Maryland, and the department could easily input information into it.

Long-range Goals

With the long-range goal 2 years ago to get both systems operational and tie them together with communications complete, we set some new long-range goals. We hope to program all standard publications formats into the memory of the typesetter. This procedure should eliminate time-consuming page calculations and paste ups.

We hope that, within a few years, we will have all our publications on disc. Then, revisions can be made with a minimum of key stroking, saving both time and chance of error.

A current, computerized publications inventory is another long-range goal for publications and distribution. This inventory has been needed for years, but previously the department staff have had to work with the university's main computer. Now we have a computer at our fingertips.

Approximately $26,000 was spent for the typesetter, $18,000 for the word processor, and $5,000 for communications. Previously, we had spent approximately $10,000 to $12,000 per year on contracted type for about one-third of our publications, and we purchased a new typewriter every year or two for production of the remainder.

In a few years, all publications will be set in type and stored on disc memory for future revisions. Already the department is realizing some savings in the number of paper-plate-impressions since typeset copy cuts down the length of publications. And, as importantly, everyone in the department is extremely pleased with the quality appearance of the publications. □

Guiding Local Officials Through the Computer Age Maze

Sue H. Jones, Editor
Southern Rural Development Center
Mississippi State University

An Extension model for guiding local officials through the maze of the computer age could help bring city and county governments a new efficiency in financial management.

"Computers are electronic filing cabinets which allow rapid access to records," explains Mary Ball, local government specialist for the Mississippi Cooperative Extension Service. "Time-consuming tasks become streamlined and routine after the initial run, and a 2-week task by hand can sometimes be reduced to only 7 minutes by computer."

While many local government officials recognize the time-saving efficiency of computerized financial records, they also see the complex problems of selecting and paying for a computer system.

"Most government officials don't know anything about computers and find it difficult to make informed decisions about the use of computers," Ball says. "What local officials need when they are approached by high-powered computer sales people is technical assistance that will aid them in making an intelligent decision."

Working Model

In an effort to provide state Extension staffs with a model for offering this assistance, Ball and project team members from three land-grant institutions recently developed and tested a working model for transfer of computer technology to county officials.

The project was funded by the Southern Rural Development Center and included the participation of Gerald Doeksen and Charlie A. Burns, Oklahoma Cooperative Extension Service, and John Scoggins, University of Georgia Institute of Government.

Project team members selected Woodward and Washington Counties in Oklahoma and Yazoo County in Mississippi as pilot counties to test the model. The Yazoo group marked the first time that a city and county in Mississippi have cooperated in a joint computer project.

In addition to working on the regional project, Ball regularly provides technical assistance to Mississippi communities converting to a computer to increase the efficiency of such financial operations as tax billings, utility billings, payroll, accounting, budgeting, and collections.

Assess Need

"It's important to emphasize that all cities and counties don't need computers," she says. "Extension can help local officials determine whether or not a computer will help them do their jobs better."

"We can look at what they are doing, analyze the needs of the governments, help them learn how to computerize their records, and tell them what it will cost."

"The computer programs are, by far, the most important part of a computer system," she explains. "Many local government people don't realize this. I don't recommend one program over another. In fact, I don't decide if they need a computer. My role is to help them organize their needs so they can see if a computer will help them. Then I help them locate what's available in computer systems."

Comparing the use of a computer to using a telephone, Ball says that local government officials don't need to become computer experts.

"You don't have to know how a telephone works to use one," she said. "It's the same with computers. You can use this tool without knowing the technical aspects."

The computer assistance model used by Ball and the project team was developed by Scoggins, a nationally recognized expert on computerization for cities and counties. Scoggins served as technical consultant for the regional project.

Plan Unfolds

The first step in Scoggins' plan to assist local governments in computer selection includes spending several days with elected and appointed officials to determine the quantity and type of work done by various government offices. Then the Extension specialist compiles this information and prepares a report for these officials. The report lists those activities which can be computerized and estimates associated costs.

The second step requires preparation of specifications for local government officials to send to computer companies inviting them to bid. After the bids are received, the Extension specialist arranges for demonstration of those computers which public officials think may do the best job for them.

Computer vendor demonstrations consist of having the vendor demonstrate the hardware and software of each proposed system and answer any questions local officials may have concerning this proposal. Each vendor is encouraged to provide local officials with "hands on" experience in using equipment.

After these demonstrations, the Extension specialist prepares a written evaluation summarizing the proposals. The evaluation discusses the pluses and minuses of each proposal including such considerations as the reliability of equipment, capacity for growth, the company's existing systems in operation, hidden costs, etc.

"When officials have selected the top one or two computers they like best, we help them prepare and negotiate a contract," Ball says.

Vendors usually have a prepared contract they ask local government officials to sign, but Ball never recommends signing a vendor's contract. Instead she submits a contract to the vendor which reflects the best interest of the county and then negotiates any changes in the contract which the vendor may require.

Later Ball helps to monitor installations of the computer system to be sure it is meeting the contract specifications.

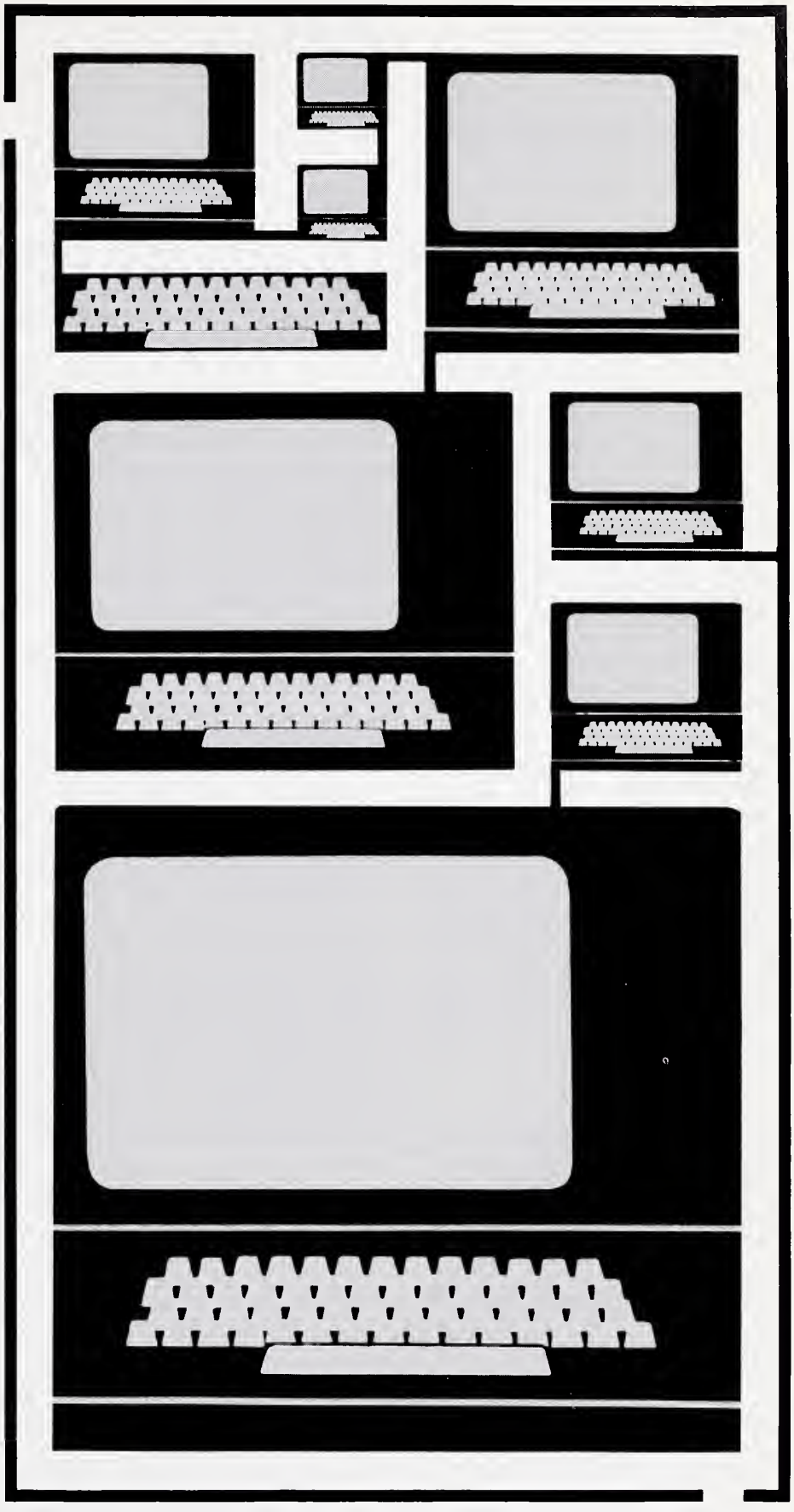
"The whole process takes anywhere from 6 months to a year," Ball says. "Officials need that much time. It allows them to become fully involved and to make knowledgeable decisions on their own."

In the last 4 years, Ball has provided this free technical assistance to 20 city and county governments in Mississippi.

Project Results

"We will be publishing the results of this regional project during the summer months," explains William W. Linder, director of the Southern Rural Development Center. "Our intention in funding this project is to provide a tested, working model that other state extension services can use in transferring computer technology to county government officials."

"Efficient financial management is essential to local government, and we hope we can help Extension to bring the efficiency of computer technology into the county courthouse." □



High Tech for Food and Nutrition

James Wolfe,
Writer-Editor
Extension Service, USDA

High tech is on the upswing at many of the land-grant colleges throughout the United States as Cooperative Extension specialists find multiple applications for electronic technology in their various food and nutrition programs.

One example, DIETCHECK, a computer program for nutrition evaluation and research, has been developed by Extension specialists at the University of Nebraska-Lincoln. More than 125,000 users have had "dietchecks" since 1975 when Harriet Kohn, Extension food and nutrition specialist, and Thom Thompson, professor of agricultural engineering, developed the program.

DIETCHECK is used in a wide range of adult Extension programs including the Expanded Food and Nutrition Program (EFNEP) and various 4-H projects. Other users include nutrition researchers and educators, health department workers, and members of weight control organizations. College athletes, including players for the Nebraska football team, have found the program invaluable for analyzing the effectiveness of their present diets.

Access to DIETCHECK is made through a portable terminal that looks like a typewriter. The computer interacts with the user and asks questions. The user's answers are based on one to 14 days' food intake or menus. Only 10 minutes after the answers have been coded and entered, a printout is available.

Calorie Count
DIETCHECK analyzes 18 different nutrients and their calorie counts and compares nutrient intake with the Recommended Dietary Allowances (RDA).

Additional options are available on DIETCHECK. "If requested," says Kohn, "the program will supply data on the percent of calories obtained from various nutrients and alcohol. It will also provide desirable weights and a list of foods containing three percent or more added sugar."

A new version of DIETCHECK became available in 1981 that contains updated data bases and some new options. Both the new DIETCHECK and old DIETCHECK programs are carried by AGNET, a delivery network for computer programs that is accessed by other states and foreign countries. (See story on AGNET system on page 10.)

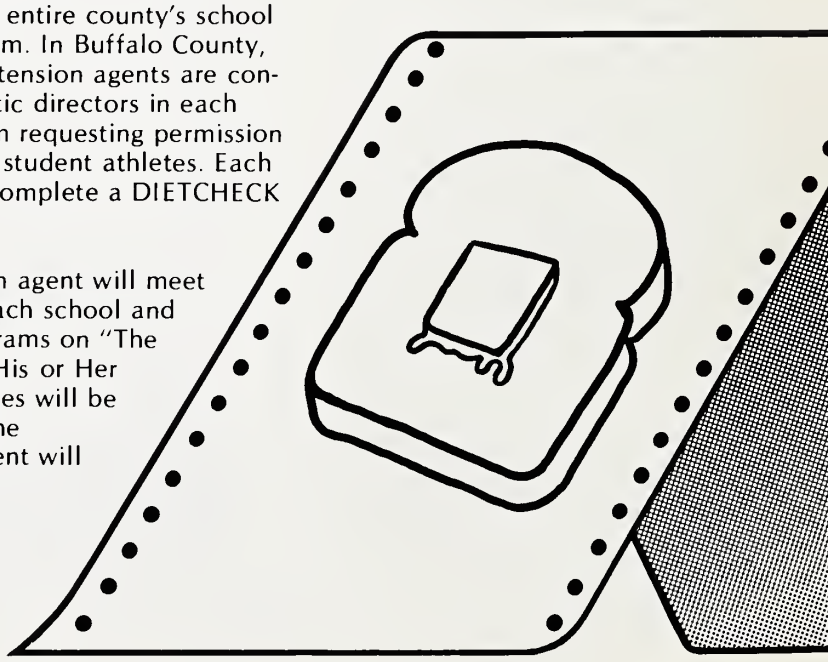
DIETSUMMARY, available for the old DIETCHECK, is a companion computer program used to summarize groups of DIETCHECK analyses. A new DIETSUMMARY program will be available in 1982. "The summary is helpful," says Kohn, "in evaluating the impact of nutrition education programs and conducting needs assessments."

Nutrition in the Lineup
A plan is underway to use DIETCHECK in an entire county's school athletic system. In Buffalo County, Nebraska, Extension agents are contacting athletic directors in each school system requesting permission to work with student athletes. Each athlete will complete a DIETCHECK form.

The Extension agent will meet athletes at each school and present programs on "The Athlete and His or Her Diet." Analyses will be shared and the Extension agent will counsel those athletes wishing to change their diets. "DIETCHECK," says Kohn, "is proving to be an excellent tool to help people where their diets need improvement."

Quick Tally
CES specialists at Virginia Polytechnic Institute and State University (VPISU) have developed two ongoing computer-assisted instructional programs aimed at improving food consumption habits and minimizing food shopping costs. Both programs employ DIALCOM and are accessible at the unit level through remote terminals.

One program, RCALL, is being used to tally an individual's consumption of several nutrients and to compare intake of these nutrients with the RDA for the appropriate sex-age group. The other program, GROCR, is a simulated food shopping experience where the computer helps the shopper select foods at the lowest cost per serving.



Diet Evaluation
The RCALL printout can help a user spot and correct a nutritional deficiency. Barton recounts an RCALL educational program held in Smyth County where one of the women attending was motivated to see her doctor because the printout showed that the fat content of her diet was too high.

"She was unaware of the high fat content of the cheese, peanut butter, and meat in her diet," Barton says. "She saw her physician and he recommended a new diet plan which she followed. A recent second RCALL printout indicated a significant reduction in fat and total calorie intake."

Extension agents in Roanoke, Va., report successful results from the RCALL program in that city where it was presented in turn, to participants at a health fair held at Virginia Western Community College, enrollees in a weight control program, and student nurses.

Shop at GROCR
GROCR, the other computer program at VPISU, was developed by CES to encourage thrifty food shopping. This program groups foods with similar nutrient content together. The user receives information about the market unit size (pint, quart, etc.), number of servings per market unit, and cost per serving.

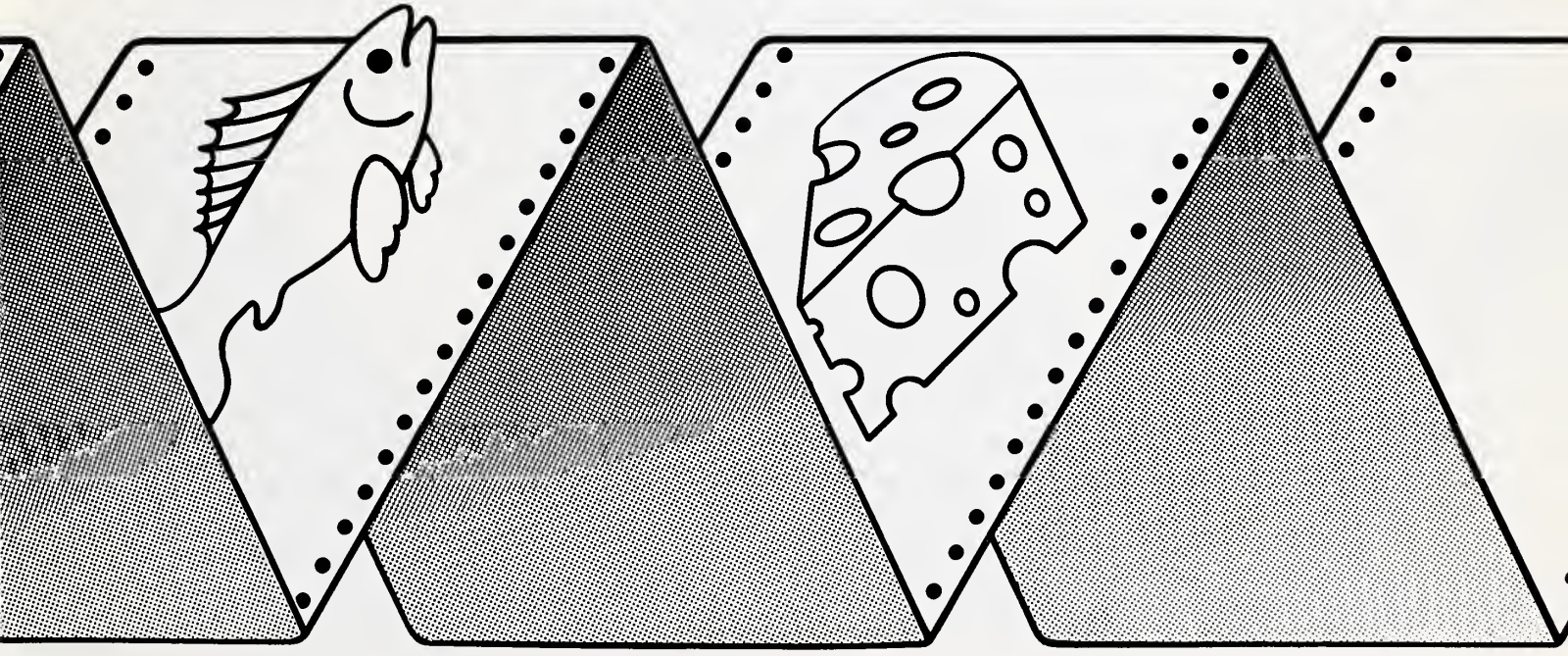
The user selects the servings of foods needed for a week, minimizing cost by selecting foods with the lowest cost per serving. The printout is, in this case, a special shopping list showing quantities of foods to be purchased and approximate final cost.

A "Menu Pricing" computer program has recently been developed that will provide assistance to the food service industry. It gives food service managers the data they need—correct sales mix, food cost, and selling price combinations—to make their operations cost efficient.

Analyzing Intake
At the University of Kentucky, CES interest has focused on educational mini-computer programs on diet and nutrition. A computer program called DIETANAL ("Diet Analysis Computer Program") is being offered that analyzes 24-hour intake of five major food groups. In addition to calories, the program tallies the following five nutrients: protein, iron, calcium, and vitamins A and C. The program has seen extensive changes since the original was obtained from CES at the University of Minnesota.

DIETANAL requires the user to complete a 24-hour food intake form. "The program compares intake to the Daily Food Guide and the RDA's for the five nutrients and calculates differences," says Fudeko Maruyama, Extension food and nutrition specialist at the university.

"If intake of a nutrient is adequate," she says, "the program prints a list of foods consumed that supplied it.



However, if intake of a nutrient is less than two-thirds the RDA, the program printout displays a list of foods that will furnish more of that nutrient. Users report that the nutritional advice on the printout is easy to understand."

The program is written in BASIC for microcomputer and is also available in Fortran on mini-computer.

Young at Heart?
Another CES program at the University of Kentucky available on mini-computer is HHA ("Health Hazard Appraisal"). Health agencies and physical fitness centers are finding this program valuable in reducing health risks when individuals are about to involve themselves in such changes in lifestyle as a weight reduction or a physical fitness program.

After the user completes a HHA questionnaire, the program analyzes an individual's health history and lifestyle and calculates a "health age" that may be higher or lower than the user's chronological age. Risk factors are calculated based upon age, sex, health status, and lifestyle.

The printout suggests appropriate preventive health measures—such as dietary or other changes—necessary for reducing health risk. The program is written in Fortran and is accessed by telephone and a portable terminal.

Nutrition Awareness
NUTRI-FIT, the computerized food-activity analysis program recently developed by CES at Colorado State University and administered through the Food Science and Nutrition Extension office, employs the AGNET system and is useful to the general public as well as specific individuals suffering from hypertension and overweight.

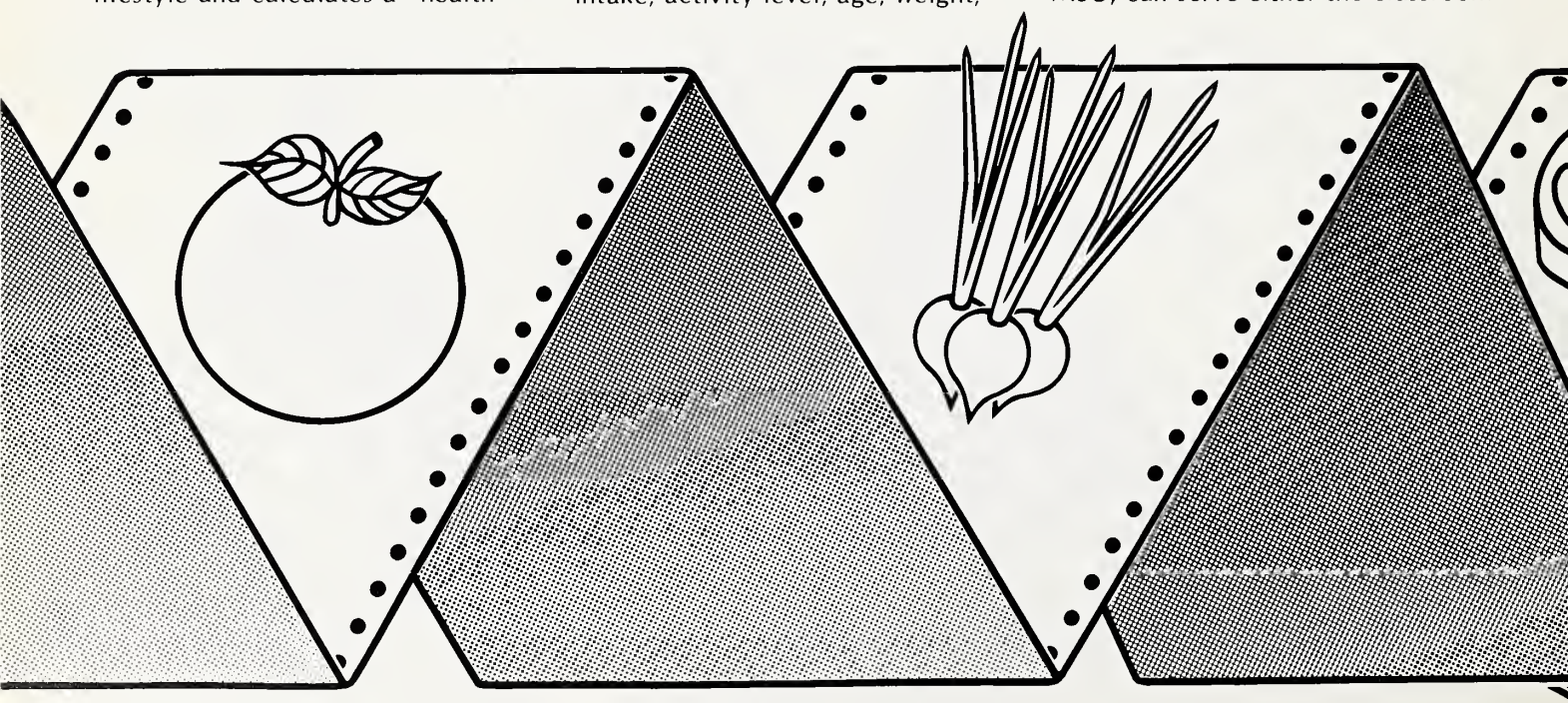
The program requires that the participant submit information on food intake, activity level, age, weight, and sex. The program then calculates and delivers a nutrient analysis of foods eaten, and an estimate of caloric needs. The printout also makes weight loss projection where appropriate.

"One of the goals of the program," says Jennifer Anderson, food and Extension specialist at CSU, "is to help people become more aware of their food habits and activity levels."

The printout, she explains, can be used as an educational tool to teach nutrition principles and concepts.

Sharing Expertise
TELPLAN, the computer system sponsored by CES of Michigan State University, is an operational example of sharing computer expertise for educational purposes.

The program, explains Irene Hathaway, Extension specialist in Family Resources Management at MSU, can serve either the classroom



or Extension work with farmers, consumers, families, businesses, and others.

TELPLAN is accessed by a variety of terminals ranging from 70-column printers to cathode-ray tubes to microcomputers set up as "dumb" terminals.

"TELPLAN's programs are listed under six major headings," Hathaway says, "but users should study all categories for which a program may exist." Five food and nutrition computer programs can be found under the "Family Living" heading.

Two of the programs—in old and new versions—are concerned with "Calcium for Consumers." Users are helped to compute weekly RDA for calcium intake, and weekly cost-savings in reducing overconsumption or cost increases in making up calcium deficits.

A program called "Targets for Food Spending" helps users design a personalized spending plan for their family.

"Dollars and Decisions in the Supermarket" is a program that helps the user calculate food-cost comparisons for a household, based on size and consumption patterns for selected foods. "This program," says Hathaway, "shows what a difference the forms, brands, and package sizes can make in the yearly food bill."

"Nutrition Spotcheck" analyzes the user's 24-hour food recall for several different nutrients based on the RDA for 1980. Nutrients are analyzed by meal; calories are examined and broken down into protein, fat, carbohydrates, and alcohol.

From FOOD to LEAN

Six food and nutrition computer programs are available from the Agricultural Extension Service at the University of Minnesota. The system—called MECC (Minnesota Educational Computing Consortium)—offers programs now being accessed, through cooperative arrangements, by most of the public schools in the state.

FOOD (Food Dollars) uses the USDA Food Plan cost and food quantity recommendations to determine reasonable food expenditures and food quantities to purchase. It is designed for a specified time period for a specified family size.

FOINANA (Food Intake Analysis) helps users evaluate the quality of a 24-hour food intake based on the Daily Food Guide and on nutrient content compared to the RDA's. If the user requests, the program will supply food sources of the nutrients.

RECIPE calculates the amounts of eleven nutrients in a user's menu, food intake, or recipe. The program compares totals to the RDA's for user-designated age-sex groups and reports and graphs the precentages.

NUTALLY (Nutrient Tally) calculates, then totals and graphs 20 nutrients in a list of foods in a menu, recipe, or food intake list. The nutrient totals are evaluated based on an RDA selected by the user. This program allows the user to change foods to adjust the nutrient content of a menu while planning it. It offers an extensive food item data base.

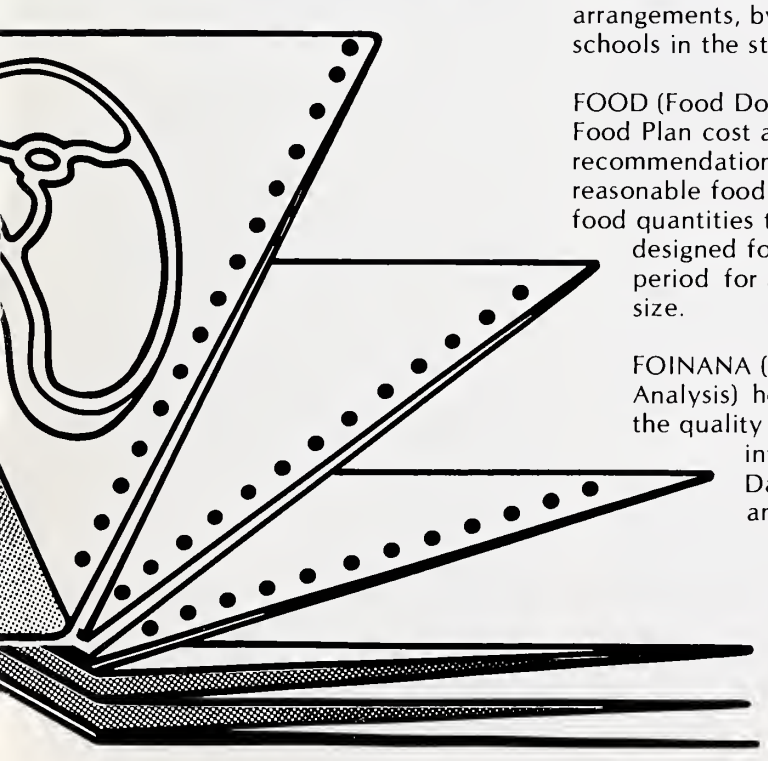
RECALL calculates the amounts of nutrients in a 24-hour food intake based on the Daily Food Guide and 9 nutrients.

LEAN (Learning About Eating, Activity, and Nutrition) helps students understand the balance of energy in food consumed with energy used. It has a limited food item data base.

Food and nutrition programs for microcomputers are also becoming available, reports Joanne Slavin, Extension specialist and assistant professor of nutrition at the university. Three programs—FOINANA, LEAN, and RECIPE—converted by MECC to run on the APPLE microcomputer, will be offered in the near future.

A nutrition diskette for the APPLE with simple programs on fast foods, energy, cereals (with sugar content), and vitamins will be made available soon, says Slavin.

Throughout the United States, CES nutrition specialists are using electronic media in ingenious ways to make high tech an effective and efficient tool of today's nutrition education programs.



TODCOMP—Programming A Future

Jim Shaner, Information Specialist,
Agricultural Editor's Office
Phil Leslie, Senior Information Specialist,
University Relations,
University of Missouri-Columbia

A chromium hook moves a lever forward on her chair. Responding with whirs and clicks, it wheels her into position at the terminal.

Over the keys, she hunches—disabled early by an accident, a disease, or a defective gene. Touching the keys, she talks in apersands and PIPs. They use languages that are foreign—yet internationally known—BASIC, COBOL. Together—she and the computer—can move carloads of grain, ultimately to another continent.

Information, punctuated by electronic beeps, flashes on a charcoal-gray screen. She's in control!

Missouri's TODCOMP program, like more than 20 others across the Nation, trains physically handicapped people in computer programming. So those who can't see, or hear, or walk become productive members of business and industry and full participants in American society.

TODCOMP (Training of the Disabled in Computer Programming) is a University of Missouri-Columbia Extension Division program. It has served students from Missouri and several other states in the central Midwest since 1975.

Since TODCOMP began, 52 individuals have graduated from the program—a 55 percent completion rate.

"The completion rate may not be as high as we would like," says Ronald Wilson, TODCOMP director. "However, this is an intensive, difficult program. We are here to help our students become successful, proficient computer programmers who can meet the high production standards of potential employers."

Slowly, standards were raised to ensure graduates were "job ready." A committee of professional programmers certifies each student after studying his or her programs and computer skills.

Wilson is quick to add that otherwise employers would be reluctant to hire TODCOMP graduates. A placement rate of nearly 80 percent, at an average annual starting salary of $15,000 seems to support this professional approach.

Taxpayer Benefits

"And it should be pointed out that for every person employed from this program, society receives a productive worker who pays an average of more than $4,000 annually in social security and income taxes," Wilson explains. Adding that to the $7,000 annual disability income each received before entering the program means more than an $11,000 direct benefit to taxpayers.

During the 10-month training session, TODCOMP students receive not only the training necessary to make them proficient programmers, but also the independent living skill training to enable them to take care of themselves on and off the job. Ellen Scheer directs the computer programming training, while Cathy Unterreiner directs additional training in developing independent living skills.

"The two aspects are closely connected," says Scheer. "For students to be successful on the job, they must master both the programming and the living skills."

To better emphasize programming theory and concepts, Scheer and her staff teach BASIC, an easy-to-learn computer language. Then they move students to COBOL, the most frequently used language of the business world.

Living Skills

When TODCOMP students are not involved with computers, they're dealing with such skills as working with people, home management, community involvement, and various aspects of daily living.

"We offer living skills instruction on three levels," says Unterreiner, "for the whole class, in small groups where specific skills are needed, and on an individual basis."

Specific skills taught through the program range from resume writing and job interviewing to drivers education. But TODCOMP's rotational housing program seems unique.

For the first 5 months, students live in apartments at the training site, 10 miles south of Columbia. Unterreiner supervises an occupational therapist who helps the students who need it to learn to live life on their own.

For the last 5 months, students move to accommodations in Columbia and commute daily by van to the TODCOMP training facility.

"The move to Columbia is designed as a transition phase in which students can more fully utilize their independent living skills and assess their adaptive equipment needs," says Unterreiner.

Programming Skills

TODCOMP works. G. D. Miller, supervisor of the computer project in the Missouri Department of Revenue, says this about the graduates he employs:

Above: Ellen Scheer, director of computer programming training at the university, lectures a group of intent participants in TODCOMP.

Left: "Signing" their conversation, three students of TODCOMP solve a problem at the computer terminal.

Far left: Steve Summers, a former assistant in the TODCOMP program at the University of Missouri, prepares to serve. TODCOMP graduates are taught to master both computer programming and countless living skills.

"They have received some of the finest data processing training available in the industry. The most striking characteristic of both of these individuals is their motivation. They both are willing to put in additional hours, working independently, to reach their objective."

Michael Maxon, the lead analyst-programmer, averaged 40 hours a month overtime for the last year "to meet imposed deadlines."

"Since TODCOMP has access to the University of Missouri's Data Processing Center's associated hardware and software, graduates have a greater opportunity to be useful earlier to large data processing shops," Miller continues.

"Also, their on-line programming background gives them an edge over other technical school graduates because we have found that few of these schools provide large main frame training and on-line programming facilities."

After two successes, the TODCOMP faculty is starting to work on another type of handicap—emotional disabilities. "We didn't do it in the first place," says Wilson, "because we felt we weren't able to deal with emotional problems." But a rehabilitation counselor persuaded Wilson and his staff to reverse their decision.

"All students can use help handling their emotions, at times," says Wilson. Like that of other programs, the help offered by Missouri's TODCOMP reaches beyond finances to feelings. □

Instant Outlook

Judith Armstrong Bowers
Public Information Specialist
Extension Service, USDA

An Extension marketing economist in Oklahoma wants the latest national figures on cattle on feed . . . A farm management economist with Extension in Nebraska needs data on soybean and sorghum output . . . In New Jersey, a counterpart will use the latest available statistics on vegetable crops for a class later in the day.

Each of these Extension economists will get their answers from the same source—COIN, the Extension Service's nationwide Computerized Outlook Information Network.

COIN began about 7 years ago as an experimental method for getting the U.S. Department of Agriculture's national outlook reports to Extension economists throughout the country by the fastest technological methods known. Today, as then, Extension farm management and marketing economists use these reports as a base for educational outlook work.

USDA's Extension Service initiated the experiment, later to be termed COIN, in 1974. ES established a special test project in Minnesota, carried out by the Extension economists there, who loaded the reports on the Computerized Management Network (CMN), which was being operated by Virginia Tech. But this process proved to be too cumbersome, especially as most of the reports originate then, as now, in Washington, D.C., where problems associated with them need to be resolved. So, now, the COIN reports are loaded onto CMN by ES-USDA staff members in the Washington, D.C., office.

COIN, itself, is one of the programs in CMN, a national computer time-sharing system that carries about 70 farm management and home economic programs used by Extension workers. CMN, in turn, was developed and tested by the CES through ES-USDA funding starting in 1969.

Types of Data on COIN

Currently, COIN contains four types of materials. First are the periodic USDA Crop Reporting Board reports prepared and kept under security conditions by USDA's Statistical Reporting Service (SRS). These reports remain under lock and key until 3:00 p.m. on the day of release, at which time they are transmitted to the state crop reporting offices and to ES-USDA for processing. The reports are moved from the SRS computer to the CMN computer system. Each file receives a code name. This name and its description are put into a listing of all files available to users of CMN. Any file or table over 72 characters wide gets divided into two portions. The second portion prints under the first.

The second set of materials in COIN are the summaries of commodity situations released by the World Food and Agricultural Outlook and Situation Board. These summaries are loaded onto the SRS computer where they are reloaded onto CMN. Extension staff members assign a file name, and they add the new names to the file listing.

Daily or weekly releases are the third type of outlook materials: USDA news releases that involve outlook, the daily National Grain Summary, and the Weekly Roundup of World Production and Trade Report. Extension staff members enter these materials directly into COIN. State Extension economists load the fourth type of outlook materials onto the system—their own analyses made immediately after certain USDA reports have been released. For example, the day after the release of the Hogs and Pigs report, three or four Extension economists in the states interpret what these numbers mean nationally and locally and load their analyses on COIN.

Report Schedule

ES staff members coordinate, maintain, and load all Washington-originated reports onto COIN. The staff also prepares a monthly listing of all USDA reports to be available and sends their users advance copies. An advance copy of the schedule of releases is kept in COIN too, for user reference, plus a listing of files that are currently available. (Note: address inquiries on scheduling and availability of reports to Buel Lanpher, program leader—farm management, Extension Service, Room 5503-S, U.S. Department of Agriculture, Washington, D.C. 20250 (202) 447-7165.)

To date about 40 states access COIN, primarily Extension farm management or marketing specialists who develop outlook information for their state or who use outlook information. Area and county staff members in several states also use selected reports on the system.

Easy Access

COIN is easy to use. To learn how, I went to Buel Lanpher's office and sat down with him in front of his electronic data terminal, a Silent 700 Texas Instruments model (any terminal can be used). To access the CMN system, Buel dialed the computer on the telephone and put the telephone receiver into the modem attached to the back of the terminal. Next, he entered his ID number and password, and the system identified itself to us on the printout paper. Lanpher then asked me to type OUTLK, the program name. The program asked if we wanted a listing of file names (an index) and I typed in y, yes. He explained that OUTLK reports over 2 weeks old generally have been purged by

Extension staff because hard copies have been mailed out to users. With the introduction, by SRS and the Economic Research Service (ERS), of fees for these reports, the schedule for purging reports may be reexamined. Generally, purging occurs because of the cost of storage in the computer.

After deciding on the file I wanted to see, I typed in WHPAST and CR (carriage return) to get the Winter Wheat report. The machine then printed out a short version of the report. After we finished, we signed off by typing in BYE. The system typed the approximate cost and time we had used.

People overseas can access the system, Lanpher says. They pay the cost of the long distance call, so the system is expensive for them. Another current limitation is that a user interested in data only on one state cannot access just those data from the reports online. Ability to get such data by individual state would have to be programmed into COIN.

Using COIN
To use COIN, you make an agreement with persons running CMN. After that, your startup cost would be for a remote computer terminal, which could be a micro-computer with a modem communications interface. After that, you pay only for the connect time.

The ES Agricultural Programs staff issues a monthly schedule of outlook releases, giving data available, file name and report name, agency and release date, file description, and names of any Extension analysts providing analysis on the subject. A list of the reports on COIN follows:

Crop Reporting Board Reports (CRB)
Once a Year
Annual Crop Production
Planted Acreage
Soybean Stocks
Winter Wheat
Cattle Inventory
Prospective Plantings

Four Times a Year
Grain Stocks
Hogs and Pigs
Milk Production
Livestock Slaughter
Eggs, Chicken, and Poultry

Monthly
Crop Production
Potato Stocks (at end and beginning of year)
Agricultural Prices
Cattle on Feed

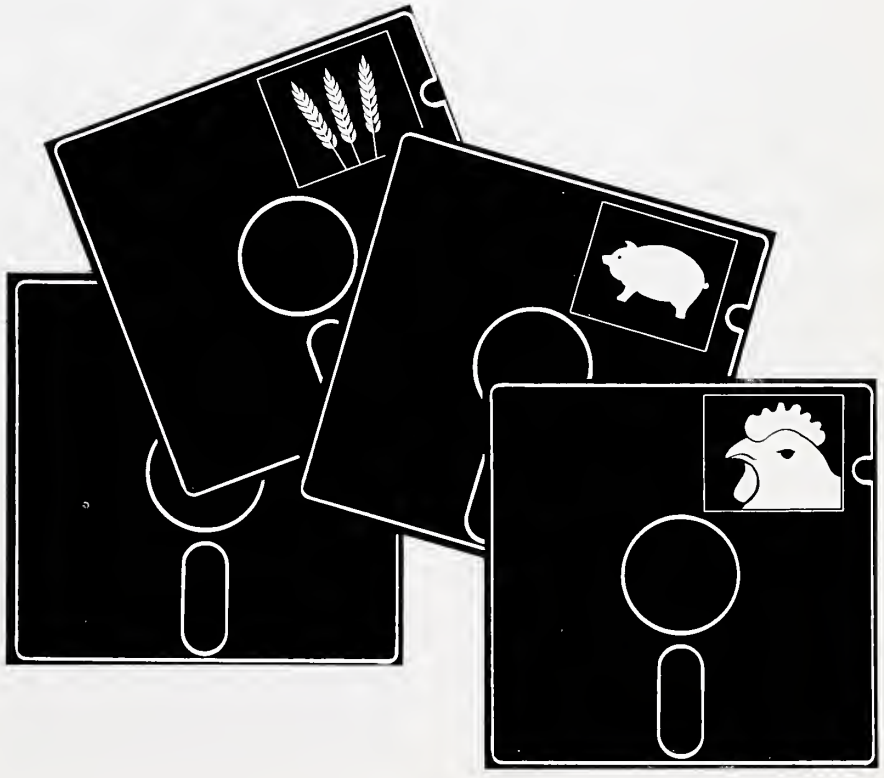
Weekly
Broilers (State Broiler Placements)
Crop Weather
World Weather & Crop Bulletin (jointly with NOAA)

Economic Research Reports
Commodity Situation Summaries (13 reports; 2-6 times a year)
Agricultural Supply and Demand Estimates (1-2 times most months)
Agricultural Outlook (11 times a year)

Foreign Agricultural Service
Weekly Roundup of World Production and Trade

State Extension Economists' Analyses
(These analyses are loaded following key CRB reports and Agricultural Supply and Demand Estimates reports)

COIN will be shifted onto DIALCOM, Extension's electronic mail system. The transfer should be finished by the end of the summer. For a while, COIN will be on both systems. For more subject-matter information, contact Buel Lanpher at address previously given. For more technical and computer information, contact Robert Routson, Systems Analyst, Technical Information, Program Development, Evaluation, and Management Systems, Extension Service, 5th Floor, National Agricultural Library, Beltsville, Md. (301) 474-9020. □



FACTS, Six Years Later

Eldon E. Fredericks, Head
Departments of Agricultural
Information and Audio Visual Production
Purdue University

Indiana county Extension workers prepared to greet the 21st century on August 31, 1976. On that date an agreement with the Kellogg Foundation and a later special-challenge grant from the Indiana General Assembly provided the initial funding for the Fast Agricultural Communications Terminal System (FACTS).

In 1976 FACTS was unique. In 1982 FACTS retains some unique characteristics but much of its uniqueness is gone . . . "and that's as it should be," says Indiana Extension Director Howard Diesslin. "Our request to Kellogg included the desire to develop a model that other states could adapt for their own specific needs."

In 1982 FACTS still claims to be the only statewide Cooperative Extension Service computer network with a microcomputer at each county and area office throughout the state. However, several states are now building a similar network.

Five-Year Review
In his request for a 5-year review of the program, Director Diesslin asked the reviewers to "look back, size up the situation and consider adjustments that may be in order." That's what review Chairman Bruce McKenzie, Extension agricultural engineer, and his committee did. Between August 1981 and March 1982 they met frequently and talked with other agents, specialists, and clientele about issues and direction for FACTS.

In McKenzie's words used in the committee report, "We need to remember that the baby is only five years old. It's had colic, a high fever several times, cried a lot for a long time, and kept some of us up nights. A number of these problems were of our own doing or lack thereof, because as new parents, we frequently did not know what to do or how best to do it."

"Some said it would never walk, even if it could learn to crawl! The view of this committee is that it is just now beginning to run a little, really testing its legs and stamina in some areas, still faltering and stumbling but trying in others. It's had a fantastic learning process as has any 5-year-old. But this learning experience involved over 500 people in the entire Indiana Extension Service from secretaries to agents to professors. And, it was a totally new trip for the large majority," the report states.

"We're almost ready for school now; need some new clothes, need to unlearn some bad habits; have to get in a frame of mind for a structured learning experience, where we're really going to see what we're made of, and how well we can operate. We're going out to mix with the public more, now. The FACTS Garden Program is already adapted and in use in over 20 states. It was the first FACTS program marketed commercially. That commercial version ran 40,000 times in 1981, with a goal of 100,000 in 1982."

"There are numerous plusses for the total FACTS development," according to the report. "We've learned a lot about where we need to be, want to be, and some probable routes to get there. We can counsel other CES groups as teachers of the teachers. Although our system has some hardware and operational limitations, it's good enough that others want it. And, it works for us. Now, it's time to plan for the future."

Discussion for the Future
According to McKenzie, Director Diesslin placed no restrictions on the areas the review committee might consider. The committee discussion focused on three areas: a definition of functions that a computer system should perform, an improved understanding of how to integrate computers into the CES delivery system, and development of an operation and management concept for FACTS that will encourage innovation in software, hardware, and educational service.

The committee decided to review FACTS performance over the past 2-year period because the initial 3 years of development were involved in startup and limited operational capability.

Examples of FACTS Uses
Lynn Busse, associate director of Indiana's CES and former FACTS marketing manager, provided usage figures for 1981. Here is his summary by program type:

Memory or Data Base Retrieval	5,367 times
Problem Solving or Computational	12,060 times
Communications	6,277 times
Office Software	19,127 hours
Office Software	33,503 times
Other Programs	4,422 times

To illustrate the magnitude of use, the figures in Busse's table are divided by 100 (92 counties and 10 area offices in Indiana have FACTS terminals) to develop a hypothetical use for each field office. For example, each of 100 offices could have used a memory program at least once each week, to total 5,367 uses. An example of a memory program would be budget planning or pest management.

Every other day, each of our field offices would have run a problem-solving program on their terminal to equal the 12,060 uses in 1981.

Office Programs
Once each week, each office used the system to contact one or many other offices on the network, to equal the 6,277 communications uses. Communication is increasing rapidly between FACTS terminals.

Just as other electronic mail systems are gaining in popularity, so is the FACTSMAIL program. By mid-1982, the system users were originating more than one message per office per day. The central computer collects and drops mail for users in the FACTSMAIL program.

Office programs, including word processing, enrollment forms and reports, and address labels amounted to nearly 1½ hours per day by each of the terminal locations.

For the past year, if each terminal had been used an equal amount, the FACTS system recorded 2¾ uses per office per day, plus 1 hour per office per day. Some locations have gone to a signup sheet to schedule office computer use.

Is FACTS Obsolete?
The Indiana Extension workers who actively use FACTS say the system is most certainly not obsolete. However, as with all forward-looking individuals, they are looking ahead to the next generation of equipment. Many counties would like to upgrade as compatible equipment becomes available. The new equipment will probably be phased in where funds are available.

The FACTS microcomputers' contribution to office efficiency surprised many county staff members. During the review committee interview, one agent stated that his office had never effectively managed mailing lists until they got the computer. Now, for the first time, they easily and quickly cull lists so that mailings do not continue 5 years after the person died! Others commented about effective mail-cost management. While the word processing system on FACTS has been frustrating to many, it is becoming a positive asset in the larger offices where one or more staff members have concentrated on learning to use it.

FACTS application or problem-solving programs are becoming better known and in greater demand. One country office ran FX-17 "Maximum Bid Price for Land" for several different farmers who were interested in purchasing the same farmland. The requests were unrelated and the county staff, with help from FACTS, was able to provide objective information to guide these potential buyers as they face a major decision.

FACTS Programs Go National
The Indiana Cooperative Extension Service, working with the Purdue Research Foundation, has developed a commercial licensing arrangement with a national garden seed supplier to market the popular FX-4 "Home Vegetable Garden Planning" Program. In addition to the nearly 3,500 runs of that program directly by Indiana Extension workers, an estimated 40,000 persons in 20 states planned their vegetable production and preservation requirements based on family size, and personal preference, as well as size, shape, and orientation of the garden plot to the sun.

Extension agents have effectively used the FACTS garden program at shopping malls, lawn and patio shows, and other public gatherings. A portable FACTS terminal is available from the Purdue office for such demonstrations. Visitors fill out an information form and receive a personal printout on the spot or one is mailed to their home when lines at the computer are too long.

What About the Future?
Additional terminals are already needed in many county and campus department offices. New-generation equipment is in demand so that greater speed and larger programs can be achieved.

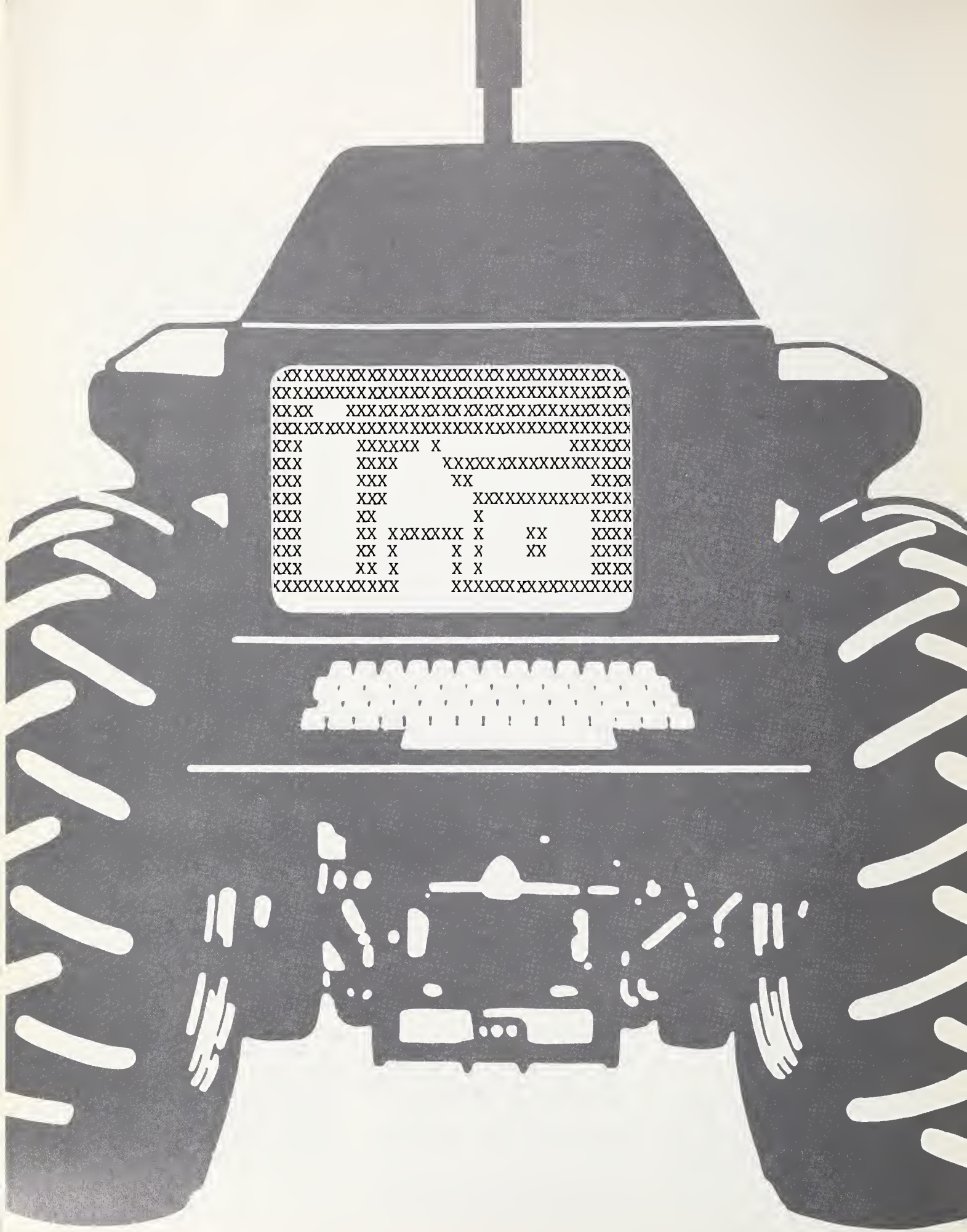
Staff training has been conducted piecemeal, on an as-needed basis, rather than following a developmental plan. Because FACTS contains an extremely high level of friendliness and consistency (every command has 'help' available), the system itself may have contributed to reducing the need for staff growth in skills and knowledge. The friendliness feature also increases the space required for operating system components and competes with the memory space available for application.

The review committee suggested that FACTS operators should carefully consider less structure in the operating system, along with the future of newer hardware This combination would allow larger programs to operate at faster speed.

Communication Uses of FACTS
Along with reduction of letters and phone calls from one office to another, FACTS provides 1 day, or less, memo response between offices. It is used extensively by several campus departments to transmit newsletters to field staff. Publication orders are transmitted via FACTS and a confirmation is returned almost immediately. Savings in postage and time are evident.

News and feature material for radio and print media are moving from the Purdue Agricultural Information Department to county offices. A bulletin board service is in limited use and a news summary program from the U.S. Department of Agriculture will be distributed via FACTS.

Six years later, FACTS is alive and well throughout the 102 field offices and the more than a dozen Purdue campus offices. Indiana Cooperative Extension agents are a lot like the drivers at the Indianapolis 500 Speedway—they like their machines, they just wish they would go faster! □



Microcomputers— As Indispensable as Tractors

Eva Dorris, Writer
Mississippi Cooperative Extension Service

There was a time when people farmed the land and fed their families without the use of a tractor. There was also a time when farmers managed and sold their crops without the use of a computer. No longer.

"The microcomputer is a piece of technology that will soon be virtually as indispensable as a tractor," says Charles Walden, economist, Mississippi Cooperative Extension Service.

"There are 300 to 400 microcomputers being used by farmers and agribusiness in Mississippi," Walden told me. "We expect that number to double or triple in the next 18 months."

"Within 5 years, a majority, perhaps as much as 75 or 80 percent, of all the production in Mississippi will be using some type of small computer. They are a powerful tool, perhaps one of the most powerful tools to arrive on the farm since farm machinery and gasoline-powered engines," Walden says.

Farmers use microcomputers to make management, production, and marketing decisions. They are building budgets, storing and maintaining records, and establishing sound financial management practices.

"Microcomputers are reliable, fast, accurate, and versatile," Walden says.

"They can be used on almost all parts of the farming operation from what, when, and how to plan, how to sell, and how to rearrange farming organizations to be more efficient and more profitable."

Initial costs for microcomputers are about $3,500 and they rarely exceed $5,000. "When you look at the price of farm equipment today and consider what a computer can do, it is a fairly cheap price," Walden says.

The level of satisfaction with computers has been high. Mississippi farmers indicate that the payoff has been quick, almost immediate, in some cases.

"Our estimates tell us that a good time period for breakeven on the actual investment in these computers is between 18 and 30 months," Walden states.

"For example, a farm record system program can replace a private service, which can cost a farm anywhere from $400 to $2,500 a year."

The problem many farmers face after purchasing the computer is finding good affordable software programs. "In most cases, the software will cost more than the hardware if a farmer has to purchase it," Walden says. "This is true whether he purchases prewritten programs from hardware and software dealers or hires a programmer to custom write programs for the computer. In either case, a full set of programs for a typical farm today would cost many times the price of the original hardware."

To address this need, Mississippi State University (MSU) is supplying original research and development programs for farmers. Staff members from teaching, research, and Cooperative Extension are developing software to fill the gap until private business can supply necessary software at competitive prices.

As the MSU software is developed, it is turned over to farmers free of charge. Three general types of computer programs are available from MSU:

- decision aids, such as a managerial package or whether to buy or sell equipment;
- data base systems in which the farmer keeps a large volume of numbers and statistics for different areas of farming or problems within farming;
- "tutorial programming" written to teach a particular subject matter or address a particular problem.

"These programs help farmers make management decisions as well as keep records," Walden says.

"Other popular programs include insecticide and herbicide selection programs for row crop production, as well as land-forming and marketing programs."

"Of these three areas, our major emphasis at MSU has been in the decision aids," Walden reports. "We are giving some attention to the data base systems with respect to chemicals and certain dairy records. We will soon begin a pilot project with one of the large computer companies to evaluate tutorial-type programming on microcomputers."

Extension Service distributes the programs through county agents. Most programs are currently available on the Radio Shack Model II and Model III microcomputer units, and will soon be available on the IBM personal computer. Future programs will be developed to be as machine independent as possible. "The most predominant brands of microcomputers being used in agriculture are the Radio Shack and Apple Corporation computers," Walden says. "The IBM personal computer has just come on the market and I suspect it will become quite popular."

"All indications here in Mississippi and throughout the nation are that we're going to computerize farming rapidly in this country," the MSU economist says. "Those who do not or who decide to wait until next year or the year after are going to be at a disadvantage." □

New Jersey Goes Computer

Veronica M. Malone
Acting Director of College Relations
Cook College, Rutgers,
The State University of New Jersey

New Jersey is a state of contrasts. For example, it's large in population, but small in size. The New Jersey Cooperative Extension Service is a mirror of that contrast. Though its staff is small, its basic philosophy is doing a lot with a little.

Approaching the computer age is the latest chapter in this story. In June 1980 an ad hoc committee on communications composed of administrators, specialists, and agents representing all program areas convened under the direction of John L. Gerwig, dean of Extension at Rutgers University's Cook College. Beatrice K. Devine, Coordinator, Extension Information Service, was chair.

Concerns
The committee grappled with how, when, and in what manner the New Jersey Cooperative Extension Service could improve its communication capabilities. Would it enter the microchip age—or would another computer form be better? Should a system be developed that could link with Rutgers University's main-frame computer? What amount of funds would word processing, management, and communications—identified early on as the major goals—require? And, in a time of tight budgets, where would the dollars come from?

The recommendation was for two-way, interactive, micro-computer systems in each county and in state offices, with the ability to communicate with each other and to access larger systems at Rutgers and in other states. Staff members asked for software that would improve office efficiency, and apply to education and data communications.

Funding
A proposal developed for the national agricultural pest impact assessment program funded a pilot program which provided computers in six counties. The remaining 24 units were purchased through savings to be accrued over a period of years in a planned approach to communications with larger groups of clientele. Each county pays for a portion of the service contract, paper, supplies, training, and telephone linkage, and it reimburses expense for staff to obtain initial computer training at the state office in New Brunswick.

After specifications were developed, 26 vendors were contacted. Eight responded with bids, and the system was eventually bought from Mathtech in Princeton, N.J., who also provided initial training for a core group.

Computers began arriving in August 1981, and training continued under the direction of Devine and Sonia B. Pollack, programmer. Eighteen counties now have micro-computers and 12 units are located in the Extension offices of major campus departments. Only three counties are not participating.

Each of the 30 units contains a video screen and keyboard, a dual disc drive, a letter-quality printer, a modem, and a telephone. Phone linkage between computers allows contact with CES headquarters, as well as county-to-county computer conversation. This phase is nearly complete.

Training
Initial training concentrates on use of the word processor because results are immediately available to the user. Additional training sessions in recordkeeping and mailing lists are then scheduled. Communications and educational functions come next.

"Everyone needs to be trained in computer use, both professional and secretarial staffs," maintains Gerwig. He also cautions that it takes about 6 months before efficiency improves noticeably.

Change
Experience at both state and county levels thus far shows that, if at least one professional learns to use the equipment well, the entire process is speeded.

How do staff view the changes in their work lives? A selection of comments from state and county professional and support staffs follows:

"As soon as we get used to this thing, we can use it in 100 other ways."

"A publication estimated for $950 will now be done, faster and cheaper; I'm in the middle of cutting up the words and tables from the word processor and adding the photos."

"A job that used to take 45 minutes by hand now takes 10. More importantly, I used to include six or seven factors, while now I consider 30."

"I can find out if someone is in a particular 4-H Club, how long he was a member and what projects he completed."

"A six-page economics newsletter with a circulation of 4,000 is now written and edited on the word processor and the forms readers return asking for bulletins or changing an address are melded to the mailing lists."

"We have not yet used it as a management tool for our Extension clientele, but that will come. Before long, farmers will have their own systems and want information on them. By then, we'll know how to give it to them."

If such enthusiasm is contagious, follow a leader and "go computer" in your state. The New Jersey staff, especially Beatrice Devine, will happily answer your questions. □

Program Predicts Energy Profits

Yong H. Kim, Staff Writer
Cornell University

Farmers wondering whether energy production from animal wastes on their own farms could be profitable can get expert advice from Cornell University.

A computer program capable of providing a set of recommendations based on the characteristics of individual farms is helping farmers across the United States make the right decisions.

Feasibility Program
Called "Methane Computer Feasibility Program," the computer-based analysis service is designed to answer questions such as the size of a methane digester, construction costs, the amount of usable energy, the reliability of the system, and so on—all tailored to specific farm sizes, conditions, and requirements.

William J. Jewell, Extension agricultural engineer in the New York State College of Agriculture and Life Sciences, says that the computer program gives interested farmers enough information to decide if a methane digester could provide them with a fuel that is cost competitive.

"This program will not tell farmers how to build a digester, or whether they should build one," Jewell notes. "It provides a general guide to help determine the feasibility of methane generation for a particular farm situation."

The computer service is an effort to speed up widespread use of a low-cost methane production system developed by Jewell and his research team. Tested thoroughly under realistic conditions over the past several years, Cornell's prototype is ready for adoption by farmers, particularly those involved in dairy, beef cattle, poultry, and swine operations.

Jewell describes the Cornell production system as simple in design and reliable in operation requiring little maintenance, and it can be made bigger or smaller for any farm size, ranging from a small 25-cow dairy operation to large feedlots.

Questionnaire
To get their farm operations analyzed, interested farmers fill out a questionnaire concerning their farm conditions. Required information includes the number and the type of animals kept; whether bedding material or milking parlor waste is mixed with the manure; and the length of time the animals are pastured.

Other information needed includes whether farmers can do their own excavation and grading for a digester site; the estimated cost of labor, if hired; the area where the farm is situated; if a loan is needed, and the interest rate; and the kind and the amount of energy now in use.

With these and other pertinent data, the computer can answer several key questions such as the optimum size of a methane digester, net energy output, costs of installation by farmers themselves or by a commercial firm, and the payback period.

Cost
Cornell's demonstration unit, which cost about $15,000 in materials and equipment, was designed for a farm with 50 to 65 cows. With annual production of net energy worth about $2,000 to $3,000, the cost of a digester can be recouped within 5 to 6 years, Jewell estimates.

"Considering rising prices for propane and oil today, even a 25-cow capacity digester can produce methane gas competitively, and a farm of 100 or more cows can produce energy at about half the cost of other fuels," Jewell says.

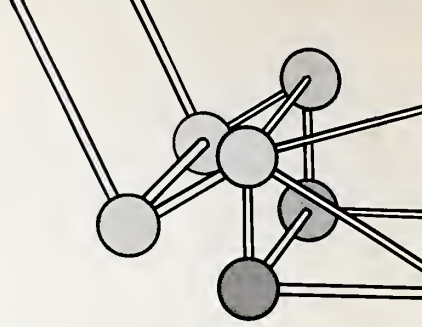
In addition to energy production, the methane production system has another major attribute: it can reduce the problem of animal wastes as a source of pollution because the digester turns manure into an odorless material while keeping the fertilizer value of the "spent" material intact for crop production.

"Odors do not return even if the material is stored all year after energy is produced," Jewell says.

Anyone interested in Cornell's computer analysis service may contact "Methane Computer Feasibility Program," Agricultural Engineering Department—Cooperative Extension Service, Riley-Robb Hall, Cornell University, Ithaca, NY 14853. The fee for each computer feasibility analysis is $20 for New York residents and $40 for out-of-state residents. □

COMNET — Computerized Communications System

Stephen B. Harsh
COMNET Coordinator
Michigan State University



With a wide range of new technology available to enhance the communications process, and a pressing need to become more cost effective, a committee at Michigan State University formed to evaluate new developments in this area.

The committee was composed of researchers, classroom and Extension educators, and administrators. After an extensive study period, the committee identified a computer-based communication system as its top priority. Thus, the COMNET (COMmunications NETwork) project was conceived.

In this study period, several factors were identified which have influenced the design and operational philosophy of COMNET. First, we desired to build upon our past involvement in the computer area. We already had established the TELPLAN system, with the assistance of the W. K. Kellogg Foundation. This host-dependent system has a library of nearly 90 programs in the areas of agriculture, family living, natural resources, and information transfer. Also, an extensive system (PMEX) for meeting the computer needs of the Integrated Pest Management program had been developed. Further, many agents have been freely using computer technology in their educational programs. The committee realized the desirability of building upon past experiences and existing resources (for example, established software). Thus, COMNET had to be a system which could achieve this goal.

The COMNET system would embrace current concepts in computerized delivery. In particular, it would encompass office automation (text processing, electronic filing), electronic mail, computerized information transfer, and networking.

Another major consideration was to develop a system which can easily adjust to new developments in the computer area. Computer technology is rapidly changing. COMNET has to be flexible enough to allow for changing directions if desirable.

It was also determined that COMNET not become a separate and independent computing center. Good computing facilities with good levels of support were already available. However, COMNET was to make it simpler for the user to access and use these facilities.

Finally, COMNET had to be a system which could be developed, maintained, and supported without adversely affecting the overall program. It had to be cost effective in helping us carry out our educational, research, and administrative activities. The development of the system could not become the primary objective but a tool to help meet other objectives.

With these goals in mind, COMNET was initiated by a redirection of financial and human resources within the College of Agriculture and Natural Resources, the Cooperative Extension Service, and the Agricultural Experiment Stations. The first computer, a Digital Equipment Corporation (DEC) 1170, was purchased and installed in January 1981 and software to meet some of our needs was purchased. A staff will develop software which cannot be purchased.

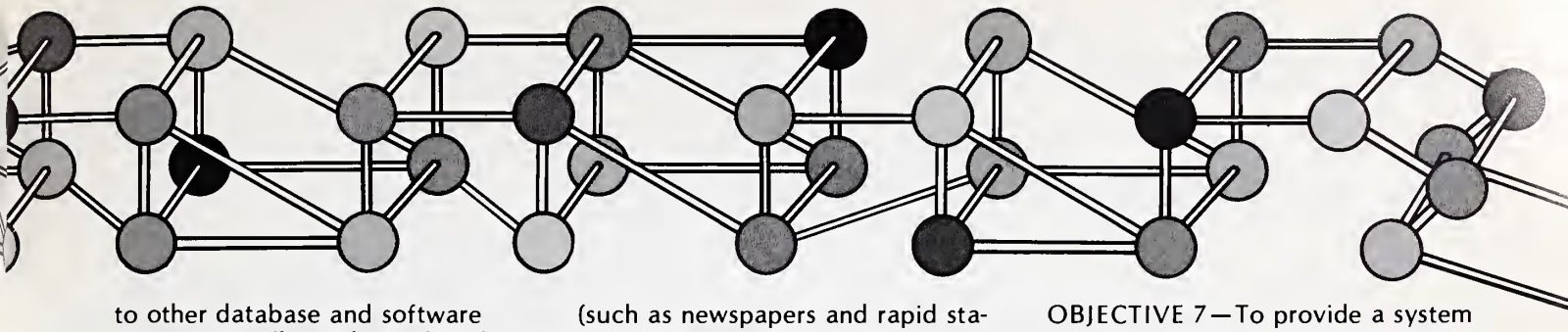
The basic objectives of COMNET are as follows:

OBJECTIVE 1—To provide a communications network to link campus departments, county extension offices, and off- and on-campus research stations. This objective is far along in the implementation process, and supporting software is in place. To date, nearly all the Michigan county extension offices have purchased a host-dependent terminal—the minimum equipment needed to interface with COMNET. Three counties have also purchased micro-computers. The ability to support both host-dependent terminals and small computers illustrates the design flexibility in COMNET.

COMNET has also been interfaced with the DIALCOM electronic mail system. Messages are taken off DIALCOM and distributed to the appropriate person via the COMNET mail system. Similarly, mail for users on the DIALCOM system is uploaded from the COMNET mail system.

OBJECTIVE 2—To provide a shared-logic text processing system to oncampus users of COMNET. This objective was achieved early. Currently, there are 42 text processing systems supported on COMNET. The software selected for this function handles mathematical equations and other complexities associated with preparing academic manuscripts. It can also interface with a phototypesetter. However, we have not yet used this capability.

OBJECTIVE 3—To provide an intelligent networking system which will link the users to a number of computer software systems such as TELEPLAN, PMEX, DIALCOM, SOURCE, COMPUSERVE, AGNET, CMN, CIS, and others. This objective allows us to build upon our past efforts as well as make access easy



to other database and software systems. It reflects the reality that we do have the resources (people, financial, and otherwise) at Michigan State University to develop and support all databases and software packages needed to carry out our research and education programs. If the needed database or software exists on another system, COMNET can be used to link the user to the proper system.

The first generation of software for implementing this objective is progressing on schedule. To date, we have developed links to PMEX, DIALCOM, SOURCE, CIS, and COMPUSERVE. We are working on a link to TELPLAN and planning on establishing links to AGNET and CMN in the near future.

The second generation of software for addressing this objective will be more sophisticated. It is anticipated that this version of software will relieve the user from mastering several sets of log-on procedures and control codes as the user attempts to access several different systems.

OBJECTIVE 4—To provide the control and communication system for a network of remotely based biological and environmental monitoring stations. This objective is directed towards assisting the researcher. For example, a researcher desiring real-time weather data from a remote location can use COMNET to access the micro-processor-based data logger which has been established to perform this task. This capability will get the researcher more timely data. The procedures for implementing these objectives are still in the planning stages.

OBJECTIVE 5—To provide a system for automating the delivery of electronic text to mass media outlets (such as newspapers and rapid stations) in a more timely and acceptable format. This objective builds upon earlier efforts in the TELPLAN project. A new version of MSUIFS has been implemented on COMNET. MSUIFS was originally built to meet the needs of newspapers which had moved to computerized text management and typesetting. This software package is used to transmit news releases to mass media outlets and Extension offices. Under development is an enhanced version of this software which will allow COMNET to deliver news releases directly to the appropriate editor at newspapers with computerized equipment. In a sense, Michigan State University becomes another newswire.

OBJECTIVE 6—To provide a system which can be built upon to establish a distributive processing network which might ultimately link individual farm businesses, agribusinesses, families, and others to the campus and other data sources. Meeting this objective is likely to involve the greatest efforts in the years ahead. There are two projects already in progress. First, we are using COMNET to download information from our MARKET program—a system for supplying COMNET users up-to-date information on selected commodity markets—into a video-text system (AGRICOM) operated by the Michigan Farm Bureau.

Second is a Kellogg Foundation sponsored project (FAHRMX) in the area of animal health. This project is using small computers in large animal veterinarian practices to maintain extensive information on the farm animals served by these practices. COMNET is being used to upload and download software among these systems and to transfer data among databases needed by the project (for example, research epidemiological databases on the campus computer).

OBJECTIVE 7—To provide a system to supply selective management information (such as account balances, and bulletin inventory levels) to county offices, departments, and the other administrative units. Software for addressing this objective is well under way. The EMPIRES system will be released in a few weeks. This package allows the user to query the system to find educational materials by subject matter, audience type, media type, title, author, and program areas, using keyword searching techniques. Other software for management control is also nearing completion.

Current Status and Future Directions

One of the major tasks in making a computer system functional is educating people to make effective use of the system. Currently over 850 people are trained in the use of COMNET. The first DEC 11/70 is nearing capacity in terms of users it can support. A second DEC 11/70 is on order and will be networked to the first system to expand COMNET's capacity. Recently a pricing structure has been established, and COMNET will be made available to outside users (for example, farmers, families, and agribusinesses) starting in July 1982.

As with any new system, we have also experienced some problems. One problem we are currently addressing is to make people aware of information management concepts. Using a computer to deliver information demands that we rethink how we package and present information and deliver it to selected audiences. Providing educational materials, training, and backup support for COMNET continues to take a significant amount of resources. □

4-H Courseware In—4-H Education Out

Stu Sutherland, Public Information Officer
Extension Service, USDA

Today's wide diversity of progress with linking computers to 4-H educational efforts goes back to the basic questions of funding and priorities. Though today's smaller computers cost less, they still cost! Once funds were committed—as earlier computers were introduced into Extension—the programming priorities more nearly reflected the needs of adult clientele in activity areas related to agriculture and home economics educational programs, for example.

AGNET

Among the many programs that are now available to those who access AGNET (see article p. 10) are those designed for use in the 4-H program. These include the eight-section 4-H health project known via computer as SHARE/CARE. The sections include: DIETCHECK; FOOD RECORDS; HEALTH RECORD; HEALTH RISK PROFILE; A HEALTH-CHECK/LIFESTYLE; HEALTH CAREERS; FAMILY HEALTH; and PERSONAL HEALTH. The independent units were developed by the Cooperative Extension Service, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Also on AGNET, but developed by a South Dakota team of specialists, is JOB SEARCH. On JOB SEARCH, 4-H'ers can access an exercise containing 15 job "clusters" to allow for identification of personal characteristics, interests, abilities, and other factors important to a young person's career exploration.

With AGNET terminals in all 23 counties of Wyoming, the CAREERS program was offered to 4-H junior teen leaders at their leader camp last summer. The AGNET SCORE program is used there in tabulating contest judging scores—as it is also used in other states. Wyoming also pilot tested the PREMIUM program in AGNET which allows for a compilation of individual awards and premium money for state fairs.

An early April letter from nearby Utah reports they have almost completed an Apple II computer program for summarizing the lengthy data required on the 4-H report form (ES-237).

In Indiana, counties use the FACTS system (see article, page 34) for enrolling 4-H members and office use as one of the management functions of the system. The FACTS system is also used for complete pre-registration for various 4-H judging contests, and contest results are computerized by batch processing through Purdue's main computer. County staff members also use the system in the publication of the 4-H Projects and Recognition Handbook, and 4-H Calendar, and for county entry blanks. Thank you, renewal, and reminder letters and different reports are also prepared, as well as county summaries, gift size summaries, membership reports, and master lists.

Tennessee reports a request to help a pair of local 4-H leaders who wish to lead a computer group who own computers.

The Extension Division at Virginia Tech-Blacksburg has developed a system known as the Computer Management Network (see article, page 00). One of the CMN programs, a 4-H computerized jogging project, consisting of 10 lessons and a 7-exercise project book to be done at home, looks very interesting—to a person like me with a slight touch of middle-age spread.

Computers at Camp

Here's how youngsters at summer camp in Kentucky learned how to use computers.

According to "4-H and Microcomputers—A Great Beginning" by Extension Agricultural Engineer George Duncan, Linda Bach, and George Turner (Jan. 28, 1982), private support for energy education sessions at 4-H summer camps was being curtailed. A committee proposed the use of micro-computers to fill the gap in the energy sessions at camp and to do so with the purchase of two computers—one for each of two camp locations.

With Extension administrative help, 10 micro-computers (trade name TRS-80, Model 1, Level 11) were loaned by the Tandy organization for the project. Coleman White, assistant Extension director for 4-H in Kentucky, arranged for the purchase of three more printers. Staff members of the Department of Agricultural Engineering developed a workable computer program.

A methodical, low-key approach was adopted to introduce the use of the micro-computers to 4-H agents and volunteer leaders. After a demon-

Far left: Participants at the 1982 National 4-H Conference were provided hands-on experience with computers and used them as a learning experience.

Below: Part of the 82 National 4-H Conference this year involved group discussions on the future of 4-H, including some hard thinking about computers and other electronic technology.

stration at a 4-H agents' and camp staff planning conference, requests were made to install the small computers in four camps instead of two, and training sessions were held in May 1980—with 48 agents and volunteer leaders attending. When the four selected camps opened for the first batch of young campers on June 2, the micro-computers were in place and loaded with programs for the 4-H members' use.

During that summer, about 4,500 of the 7,500 young people at camp selected the computers as one of their scheduled activities—with the computer sessions competing with traditional camping activities such as swimming, softball, and creative arts.

James Phelps, Jr., a Knott County Extension agent for 4-H who spent a week at the J. M. Feltner Memorial 4-H Center in Laurel County, said, "The computers actually cured five cases of homesickness the first day." He also noted that, "Working with the computers helps a child who is seeking attention, a child who is the typical rowdy camper." The only complaint about the computers that summer was that there were not enough of them.

The idea was introduced for the camps in 1981—after some pilot testing and the development of new and revised computer programs. More equipment was added so that the 1981 summer camp sessions had four camps with three computers and two printers, and a 5th camp had two computers and one printer.

Kentucky's camp enrollment for 1981 was 10,424 youth. At least 50 percent of them worked with computers—or more than 5,000 campers. Based on the camping and other computer activity, Kentucky now has an official 4-H Computer Project I, II, III, plus a Leaders' Guide.

At the Fair

In the summer of 1981, a micro-computer was set up in the 4-H area at the Kentucky State Fair, in the fall at an Energy Exposition in Louisville, and during Energy Awareness Week in Lexington. These exhibits are introducing the people of Kentucky to micro-computers through 4-H-led activity. And the micro-computers have not been idle between camping sessions as they have been requested for use by about a third of the counties for many applications.

Twenty additional computer programs were developed in the summer and fall of 1981 in preparation for the 1982 summer camp programs. Altogether, 70 mini-programs are currently available for 4-H'ers—and the 5 camps will have computers installed again for the camping this year.

George Duncan and other staff members involved sum up their report:

"Overall, the 4-H micro-computer activity has been well-received and has made outstanding progress in

the State of Kentucky. Plans are being made to improve and continue it as long as the needs of youth in Kentucky are being served and the resources (equipment, personnel, funds, etc.) are available. These resources along with the creative planning and enthusiastic cooperation by all personnel involved will truly provide the 4-H youth of Kentucky with educational opportunities and training for future leadership in America."

The Kentucky computer project group also point out that their experience has given several new perspectives to this type of activity. Standardization of computer programs has become important so 4-H'ers are able to find continuity with each project.

Major Issues

A review of available Extension-produced information and correspondence about 4-H computer applications does show some consensus on a few major points:

- The existing and appropriate subject matter projects and programs of 4-H should be a prime focus for the early use of computers.
- The use of computer technology for 4-H is a new method to increase 4-H outreach, improve instruction, and enhance the learning process for young people. The purpose is not to create computer literacy, as that is only a byproduct that will be gained by youth and adults as they use computers to acquire subject matter knowledge, other skills, and new recordkeeping ability.
- Computers will be able to let 4-H education go beyond what we could do before—we'll be able to do more indepth study and achieve greater degrees of sophistication.
- Young people like computers and enjoy working with them; the equipment and programs fit their motivations for increased new knowledge. Even the youngest 4-H members seem to know instinctively that computers will be an important part of their future, and might be a source of employment.
- As computer games have shown us, computers can display educational information in graphic form—charts, figures, pictures, dimensional drawings that can be printed out—opening some new and exciting possibilities for educational youth programs that can be designed and executed by the young people.
- Confidence of adults—both Extension staff and volunteers—about using computers is increasing as computing devices become common in our daily life and working and recreational environment.
- With computer interaction across distances it will be easier and quicker to transfer educational programs, related correspondence, and needed report materials.

Conference Recommendations

A consulting group during this year's National 4-H Conference—both youth and adults—spent time together considering how best to work computers into 4-H activities. One of the adults sitting in on the sessions reported later that the younger 4-H members were "way ahead" of the adults in computer talk, and often in ideas on how computers could be used in innovative ways. Here, in brief, are some of their recommendations:

- Modify and enhance 4-H programs so 4-H participants can use the computer as a tool in their 4-H learning experience.
- Establish a national data base to serve as a clearinghouse, for a national inventory of already developed and planned computer programs and applications.
- Place the responsibility of producing computer software in the states.
- Provide written training materials on computer application to existing projects to members and leaders.
- Design, at national level, leader resources so volunteers can access and use available software.
- Emphasize training of adult and teen leaders—who would work with members after being trained.
- Establish a national task force to develop a 4-H computer project.
- Coordinate, at state level, the development of a system to buy the hardware for counties and clubs—from available sources—with funding to be sought.
- Establish a 4-H computer newsletter at national level.

The delegates concluded that leadership needs to be identified at state and national levels so that 4-H computer application can be spurred further. Leaders are needed to coordinate development efforts and document the need for, and assist with securement of, resources to accomplish the above goals.

A report with recommendations, by a six-person Ad Hoc Committee on Utilizing Computer Technology in the 4-H Program is in draft form. "Use of Computers in the 4-H Program" will be available soon for consideration throughout the land-grant university system.

Youth delegates to the 1982 National 4-H Conference recognized that the computer was here to stay and would provide them with many career opportunities. In looking to their future, all agreed that it was time to "get on with computer action in 4-H programs."

Besides, computers make our work easier than ever before! □

In-the-Field Programming

Nelson H. Gotwalt, Writer-Editor
Eleanor W. Blakely, Writer
Agricultural Communications Office
The Pennsylvania State University

Extension agents use programmable calculators to calculate least-cost rations in the field. (Consumers of these rations often show a mild interest in the proceedings.)

Extension agents throughout Pennsylvania keep pace with technological advancements to provide farmers with information that will save them time and money.

One of these advancements is the programmable calculator. It looks like any other calculator except it can be mounted on a printer, store information, and execute a long series of mathematical calculations.

Time Saver and Educator
"It won't do anything that can't already be done by hand but it can save a lot of time, especially where a problem must be solved frequently," says John Creighton, Wayne County Extension director.

Some agents think the equipment can be useful as an educational tool too, not only as a means of answering individual farm questions.

Dairy and Beef Uses
Currently, agents and farmers use the programmable calculator to formulate dairy and beef rations, barn ventilation, estimated value of dairy forages, cost of operating motor vehicles, estimated cost of farm machine operation, depreciation, and investment tax credit.

"By using three nutritional programs written for a programmable calculator, I can formulate complete dairy rations in about 25 minutes less time than by hand," points out George Wilcox, Erie County Extension agent. "A least-cost ration also can be determined."

Wilcox emphasizes that, with the calculator, feeding values could be determined for 27 different feedstuffs. These data are compiled and included in all dairy newsletters for use in comparison shopping for the best feed buys.

Cost Savings
In Erie County complete feeding programs were formulated for scores of dairy producers. Grain cost reductions were often in the range of $12 to $15 per ton.

"While the programmable calculator shows promise as an educational tool, it does have limits," says Creighton. "Some feel it is simply a forerunner of more sophisticated equipment that will be available for Extension."

He emphasizes Extension will take advantage of available technology as much as possible in carrying out programs to supply farmers with the information they need. □

Maryland Workshops Master Microcomputers

Patricia Tengel, Family Resource Management Specialist
Ralph Adkins, Assistant to the Director
Maryland Cooperative Extension Service

The eighties began with a ground swell of interest in computers that swept across the country. Maryland was certainly no exception. Microcomputermania infected clientele, agents, and specialists. Farmers and homemakers were turning to their Extension agents and asking whether they should have a computer in their home and on their farm.

Pure Mystery
For most of the Maryland field faculty and specialists, microcomputers were pure mystery. They had formed computer concepts in terms of unpleasant, long ago, experience with main-frame computers.

The creation of a computer task force was the beginning of a continuing effort to make microcomputers a standard tool of the modern Extension agent. Initiated by Elwyn Deal, assistant director for agriculture at the University of Maryland, this broad-based group included agents and specialists from agriculture and home economics representatives from the Experiment Station and resident instruction.

At the first task force meeting it became obvious that, first, the task force needed training. The great divergence in computer experience and understanding brought its work almost to a standstill.

Computer Literacy Goal
A quick assessment showed that the task force mirrored the status of the entire Extension faculty. Computer literacy was identified as the single most important need, followed by computer personnel and hardware.

The search for computer literacy began in November 1981 when 12 task force members climbed into a university van and headed west. A snowy 13-hour trip to an onfarm computer seminar at Purdue University brought them face to face with practical microcomputer applications. More important, however, they returned to Maryland with a joint resolve to implement computer technology.

The closest thing to computer hardware in Maryland counties at that time were a few underutilized programmable calculators. In the Extension tradition of starting where the learner is, a 1-day session was held for agents who had these calculators. Basic operation and simple programming were taught so they could get more effective use from the equipment already available to them.

Seminars at Annual Conference
The computer task force devoted most of its efforts to promoting literacy in computer use for the total Extension faculty. The Annual Extension Conference provided an ideal forum for a concerted attempt to reach both agents and specialists with general information about computers. Three separate seminars were conducted, and about two-thirds of the faculty attended each session.

Persons conducting the seminars gave an overview of computer use within Extension nationwide, office management, and an introduction to microcomputers. A small computer trade show concluded the program.

Followup Sessions
To capitalize on the interest generated at Maryland's Extension Annual Conference, computer experts conducted a more indepth session 2 weeks later. Faculty members ready to use computers attended a 2-day Microcomputer Workshop on the University of Maryland campus. Emphasis began to shift from knowing computer terminology to actual use of the hardware. Availability of computers limited attendance to 35 participants.

"How to" Training
Patricia Tengel, family resource management specialist in the University of Maryland's Extension Service, began the workshop by laying the basic foundation of computer technology. She explained computer operation and data processing, and progressed into the types of personal computers available to Extension agents and their clientele. Tengel emphasized the critical importance of identifying specific computer uses and locating satisfactory software before investing in hardware. Otherwise, many personal computers will gather dust on a shelf, she believes.

Following up on the software availability aspect, Pradeep Ganguly, Maryland Extension farm management specialist, explained how to locate and select computer programs. He showed the importance of insisting upon good documentation for all software purchased. The best programs are able to be easily modified and adapted to more nearly meet the user's situation.

Tengel closed the first afternoon session with a humorous presentation showing the hazards of leaping headlong into the microcomputer era without adequate knowledge.

Hands-On Experience
David Hess, University of Maryland coordinator for management infor-

Agricultural agent Reginald Graband becomes a new "expert" on the microcomputer at the Maryland workshop. Other participants await their turn at the keyboard.

mation systems, had arranged for the first night's session in the learning center of a local computer store. These facilities allowed everyone to use a terminal or share use with a partner. Self-teaching software permitted each person to move at his or her own pace through increasingly more difficult operational procedures. For most participants, this was their first opportunity to operate a microcomputer.

In the campus setting for the second day, Hess had assembled several different brands of microcomputers from local dealers and campus departments. Although the variety of hardware may have sometimes complicated the instructional process, it allowed faculty to compare operation and output of the microcomputers.

Taking command of this assorted hardware, Gary Smith, agricultural engineering specialist, walked 35 eager students through the elements of programming. Everyone had the opportunity to enter these short programs emphasizing different problems and requiring increasingly higher levels of skills. While the examples used were in agricultural engineering, they typified problems encountered in other program areas.

Entire Staff Involved

The final afternoon was reserved for the participants to use the computers on their own. All the instructors were on hand to offer individual assistance. Software from Extension and commercial sources were available for all the machines. Home economists used programs such as human nutrition analysis and family budgeting, while agriculture faculty ran programs on farm management and machinery decision aides. Everyone appreciated the versatility of electronic balance sheets and word processing packages.

Agent and specialist reactions to these staff development efforts have been positive. For most it was their first opportunity to see for themselves the power of the microcomputer. Equally important, they were able to see beyond the "slick advertisements" and learn the time and resource commitments necessary to use computer technology.

The 35 agents and specialists completing Maryland's first microcomputer workshop will be key leaders in determining Maryland's direction in the computer field. Already they have returned to their counties of departments and are sharing knowledge and expertise with coworkers. They are continuing to call upon the workshop staff as they begin to make decisions about computer selection. They will influence many state computer policy decisions and Maryland's future direction in computer technology. □

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